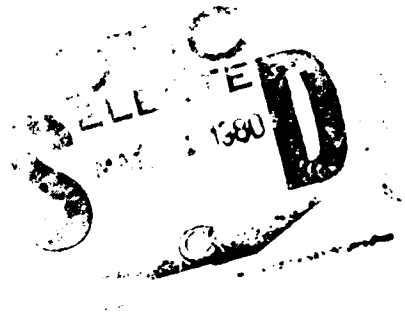
AD-A083 945 INFORMATION SPECTRUM INC ARLINGTON VA F/G 5/9
THE EFFECTS OF LOCAL ECONOMIC CONDITIONS ON NAVY ENLISTMENTS.(U)
MAR 80 M COWIN, F E O'CONNOR, L C SAGE N00014-78-C-0492
UNCLASSIFIED ISI-V-8086-07 NL

1 OF 2
AD
A083945

INFORMATION SPECTRUM, INC.
1745 S. JEFFERSON DAVIS HIGHWAY, ARLINGTON, VIRGINIA 22202 (703) 521-1050

This report was prepared under
the Navy Manpower R&D Program of the Office of Naval Research
under Contract N00014-78-C-0492; NR 170-870



THE EFFECTS OF LOCAL ECONOMIC CONDITIONS ON NAVY ENLISTMENT

ISI Report No. V-8086-07

March 18, 1980

Prepared by:

Mary Cowin
F.E. O'Connor
Lewis C. Sage
Charles R. Johnson, Ph.D.

Reviewed by:
A.S. Rhode, Ph.D.

Prepared for:

Organizational Effectiveness Research Program
Office of Naval Research (Code 452)

CORPORATE OFFICE:
1040 KINGS HIGHWAY NORTH
CHERRY HILL, N.J. 08034
(609) 667-6161

955 LOUIS DRIVE
WARMINSTER, PA. 18974
(215) 674-8022

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: ISI-V-8086-07	2. GOVT ACCESSION NO.: AD-A083 945
3. RECIPIENT'S CATALOG NUMBER:	
4. TITLE (and Subtitle): THE EFFECTS OF LOCAL ECONOMIC CONDITIONS ON NAVY ENLISTMENTS	5. TYPE OF REPORT & PERIOD COVERED: Final Report
6. PERFORMING ORG. REPORT NUMBER:	
7. AUTHOR(s): M. Cowin, F.E. O'Connor, Lewis Sage, C.R. Johnson, A. Rhode	8. CONTRACT OR GRANT NUMBER(s): N00014-78-C-0492
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Information Spectrum, Inc. 1745 S. JeffersonDavis Highway Arlington, Virginia 22202	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 62763N, RF 55-521-002 NR 170-870
11. CONTROLLING OFFICE NAME AND ADDRESS: Organizational Effectiveness Research Program Office of Naval Research 800 North Quincy Street, Arlington, Va. 22317	12. REPORT DATE: 18 Mar 1980
	13. NUMBER OF PAGES: 163
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office): F55521	15. SECURITY CLASS. (of this report): UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

Distribution of this document is unlimited. Reproduction in whole or in part is permitted for any purpose of the United States Government.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

SAME F55521001

18. SUPPLEMENTARY NOTES

Supported by Office of Naval Research Manpower R&D Program

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

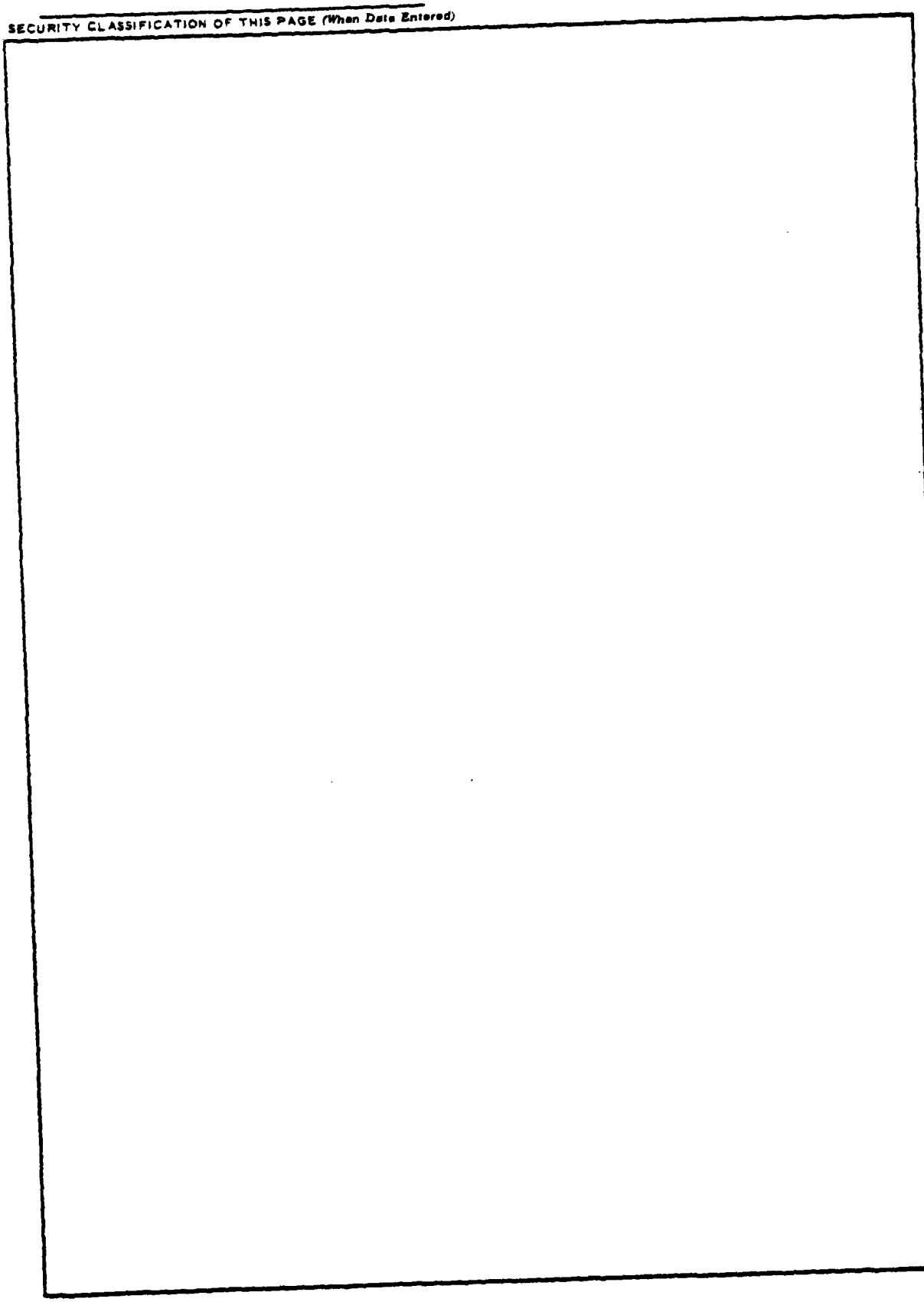
Enlistment
Local Ecomonic Conditions
Recruiter Productivity

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Cross sectional multiple regression analyses of enlistment behavior in Standard Metropolitan Statistical Areas were conducted the last half of 1975 and all of 1976. Results show significant effects of local unemployment rate recruiter density, and minority population size on enlistment behavior. Management implications of results were identified and extension of study time period was recommended to provide additional information on the impact of relative wages and local minority fraction on enlistment rates.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-LF-014-6601

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)



EXECUTIVE SUMMARY

An analysis of the effects of local economic conditions on Navy enlistment behavior was conducted by Information Spectrum, Inc. (ISI) under contract to the Office of Naval Research.

Using the Standard Metropolitan Statistical Area (SMSA) as the basic economic unit, cross-sectional regression models were constructed for enlistment rate, recruiter productivity and enlistee quality mix for the last half of 1975 and all of 1976. Local economic variables included employment, wages, unemployment and the rate of change of these variables. In addition, demographic variables were included to account for recruiter density, SMSA military population, minority population and regional peculiarities. The population of eligibles and enlistees was stratified to provide separate estimates for males and females, whites and non-whites, high school graduates and non-high school graduates, and school eligibles as defined by AFQT category and non-school eligibles.

The results of the investigation showed that recruiter density, local unemployment rate and the fraction non-white in the eligible population were consistently influential and significant as determinants of male enlistment behavior. All of these influences were somewhat more pronounced with respect to high quality enlistees (AFQT mental groups I through III upper and high school graduates).

In general, adding recruiters would have raised enlistment rates in the SMSAs in the sample, while concentrating recruiting resources in areas of high local unemployment would have improved recruiter productivity.

When unemployment data which was lagged six months was substituted for current unemployment rate in the enlistment rate estimating equation, the results were essentially unchanged. Further, the distribution of recruiters, as reflected by the recruiter density variable, was uncorrelated with local unemployment rates. These results suggest that an improvement in recruiting performance can be obtained by selectively moving recruiters to areas of high unemployment as measured by currently available lagged data.

On the other hand, the presence of a large minority population was shown to have a depressing effect on enlistment rates. Although a large non-white fraction in a SMSA was associated with depressed enlistment rates in that area, it was observed that the mean SMSA non-white enlistment rate was not substantially below the overall enlistment rates. This suggests that depressed rates in areas with large minority populations are being offset by higher than average minority recruiting elsewhere. It seems apparent that recruiting in areas with large minority populations poses special problems for the Navy.

Wage-related variables were apparently not influential as determinants of enlistment behavior. This may be due to the lack of appropriate wage data but seems more likely to reflect the dominance of job availability considerations over wages for younger workers in a depressed economy.

Two phenomena observed during the analysis, the influence of a large minority fraction and the lack of influence of wage related variables, may be peculiar to the time frame of the study

(1975-1976). To the extent that minorities were influenced in 1975-76 in their enlistment decisions by stereotypes of minority treatment in the Navy, one would expect that the observed results would become weaker over time as the results of the Navy's aggressive equal opportunity program became apparent. Similiarly, it might be expected that the continued capping of Navy pay raises and the resulting steady increase in the spread between military entry level wages and those in the private sector would eventually make wage-related variables influential in the enlistment decision process. For these reasons it is recommended that the time frame of the present study be expanded to cover the years 1977 and 1978 and that variables describing the specific ethnic composition of the recruiting force and eligible population be included. In addition to determining whether the observations of this study still held true in the more recent past, expanding the analysis to include later time periods would allow the observation of trends in the impacts of relevant enlistment determinants.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

I. INTRODUCTION

Under contract with the Office of Naval Research, Information Spectrum, Inc., (ISI), has conducted an analysis of the effects of local economic conditions on Navy enlistment behavior. Previous studies have been limited to considering the significance of national and regional economic conditions upon Navy enlistment behavior. The objective of this study has been to consider the sensitivities of enlistment to changes in local economic conditions.

During a given phase of a national business cycle, there are wide variations in economic conditions in local labor markets. In this study, local economies were defined by Standard Metropolitan Statistical Areas (SMSAs). As indicated in Table 1, the SMSA unemployment rates vary quite widely at a given point in time and in some cases move in directions opposite from the national unemployment rate. The objective of this analysis was to assess the effects of these differing SMSA economic conditions on local enlistment behavior.

A. PREVIOUS STUDIES

Recruiting qualified personnel is a problem of major importance for the military. With the advent of the All-Volunteer Force (AVF) the military must compete actively with civilian occupations for manpower. To this end, many studies of the recruiting process have been conducted.

Studies of military enlistment have generally attempted to identify conditions that influence decisions to enlist. Almost every study has included national or regional economic conditions and racial mix of the eligible population. These

TABLE 1

LOCAL SMSA UNEMPLOYMENT RATES FOR SELECTED QUARTERS

SMSA	SMSA Unemployment Rate 1975, First Quarter	SMSA Unemployment Rate 1976, Fourth Quarter	Deviation from National Unemployment Rate, 7.8% 1976, Fourth Quarter
	%	%	%
Anaheim, CA	7.6	5.2	-2.6
Los Angeles, CA	9.4	7.8	0
San Francisco, CA	10.3	9.5	+1.7
Washington, D.C.	5.0	4.6	-3.2
Miami, FL	9.1	8.1	+0.3
Chicago, IL	6.8	6.3	-1.5
Baltimore, MD	7.5	7.4	-0.4
Detroit, MI	15.3	8.1	+0.3
Newark, NJ	9.1	9.0	+1.2
Buffalo, NY	12.9	9.4	+1.6
Cleveland, OH	7.7	6.2	-1.6
Pittsburgh, PA	7.2	8.2	+0.4
Dallas, TX	5.2	4.1	-3.7
Houston, TX	5.0	5.1	-2.7
Seattle, WA	8.5	7.9	+0.1

characteristics have been consistently shown to be related to enlistment, although the amount of variance accounted for by these variables tends to be small. Organizational factors reported to influence enlistment decisions include recruiter density (the number of recruiters divided by eligible population) and advertising expenditures. Table 2 summarizes a representative selection of findings from previous military enlistment studies.

The objective of most of the early studies [1/] was to measure the impact of relative wages on enlistment. Of particular interest was determining the level of military pay that would be sufficient to attract the desired number of qualified personnel. Using national and regional time series data, most of these studies found enlistments to be sensitive to both unemployment and relative wages.

Later studies began to investigate the impacts of inputs into the recruiting process other than military pay such as recruiters and advertising. Bennett and Haber (1972) found state enlistment rates to be responsive to the ratio of recruiters to eligible population suggesting that a cheaper alternative to raising military wages would be to increase the number of recruiters. Arima (1978) and Morey (1979) investigated the extent to which local advertising expenditures affect enlistments.

B. STUDY HYPOTHESES

The principal difference between the study reported herein and earlier enlistment studies is the use of local economic data

---

[1/] Altman (1967), Fisher (1969), Cook (1970), and Rhode (1971)

TABLE 2

A SAMPLING OF STUDIES IDENTIFYING ECONOMIC

AND ORGANIZATIONAL CHARACTERISTICS RELATED TO ENLISTMENT

AUTHORS	ECONOMIC, DEMOGRAPHIC, AND OTHER EXOGENOUS FACTORS	ENDOGENOUS AND ORGANIZATIONAL FACTORS	CHARACTERISTICS SHOWN TO BE RELATED TO ENLISTMENT
Altman (1967)	Relative wages (Census region, age specific) Unemployment (Census region, age specific)		Relative wages
Fisher,A.C. (1969)	Relative wages (National, age specific) Unemployment (National, age specific) Draft Pressure		Relative wages Unemployment Draft Pressure
Cook, A.A. (1970)	Relative wages (National, age specific) Unemployment Draft Pressure		Relative wages Draft Pressure
Rhode, A.S. Gelke, J.J. Cook, F.X. (1971)	Relative wages (Census region) Draft Pressure		Relative wages Draft Pressure
Fechter, A.E. (1972)	Civilian wages (National, age specific) Draft Pressure Unemployment (National, age specific)	Military wages	Civilian wages Military wages Draft Pressure

TABLE 2 (continued)

A SAMPLING OF STUDIES IDENTIFYING ECONOMIC

AND ORGANIZATIONAL CHARACTERISTICS RELATED TO ENLISTMENT

AUTHORS	ECONOMIC, DEMOGRAPHIC, AND OTHER EXOGENOUS FACTORS	ENDOGENOUS AND ORGANIZATIONAL FACTORS	CHARACTERISTICS SHOWN TC BE RELATED TO ENLISTMENT
Bennett,J.T. Haber, S.E. (1972)	Relative wages (State, manufacturing) Unemployment (State, aggregate)	Recruiters/eligibles	Recruiters/eligibles Relative wages
Grissmer, D.W. (1976)	Unemployment (National) Relative wages (National)		Unemployment Relative wage
Donelan, D.O. (1977)	Unemployment (Regional) Population density Ethnic mix	Recruiters	Recruiters Ethnic mix Unemployment
Arima, J.K. (Dec. 1978)	Unemployment (National) Educational attainment (county)	Advertising (county) Recruiters/eligibles (county) Recruiting goals (county)	Advertising Educational attainment Recruiting goals
Morey, R.C. (1979)	Educational attainment	Advertising (regional) Recruiters/eligibles (regional) Quotas (regional) G.I. Bill	Advertising Recruiters/eligibles Educational attainment

in place of data at higher levels of aggregation (regional or national statistics). The fundamental idea underlying that choice was that recruiting is a local activity and that the basic determinants of success are local in nature. To the extent that economic factors influence enlistment decisions the effects are to be found through examination of the interaction of the individual with the economy in which he finds himself. With these considerations in mind, two hypotheses regarding individual behavior were formulated.

Hypothesis 1: The likelihood of enlistment is dependent on its opportunity cost.

This opportunity cost is measured by the availability of jobs and relative wages in the private sector of the local economy which the individual faces. These can be expected to vary among different demographic components of the eligible population. In particular, opportunity costs should vary across race, sex, ability and educational level cohorts. Thus, Hypothesis 1 concerns the sensitivity of Naval enlistments to local economic conditions.

Further, the long term aspirations of the individual may condition his outlook in searching for new employment. He may view his initial employment as entry into a career path or as simply a means of earning a current livelihood.

Hypothesis 2: In the eligible population there are two subgroups, one seeks training opportunities and a second job-oriented group, views military service simply as an alternative to private sector employment.

The former group, sensing the long-term advantages of training, may opt to enlist during times of a healthy economy, encouraged by the prospects of numerous high-paying jobs requiring skills which the prospective recruit would be able to acquire in the Navy. In contrast, the job-oriented individual may be more likely to enlist in times of high unemployment when obtaining employment in the private sector is difficult. In effect, then, it was expected that the composition of recruits would change throughout the course of the business cycle and from community to community according to their different economic conditions.

The primary tool of investigation employed to statistically test these two hypotheses was cross-sectional, multiple regression analysis covering the last half of 1975 and all of 1976. This period was one characterized by a relatively weak economy. At the beginning of the third quarter of 1975, the national unemployment reached a high of 8.9 percent. The unemployment rate then declined steadily through the second quarter of 1976, when the rate reached 7.5 percent. In the last two quarters of 1976, the level of unemployment stabilized, achieving levels of 7.7 and 7.8 percent, respectively. While these dynamics occurred in the national economy, conditions fluctuated to a much greater extent among local economies (see Table 1).

The following sections of this report discuss in detail the methodology employed in the study, the results of the analysis and the implications of those results with respect to the management of the Navy's recruiting effort.

II. METHODOLOGY

As was indicated above, separate cross-sectional regression equations were estimated for enlistees by race, sex, mental ability, and education. The unit used for defining a local economy was the Standard Metropolitan Statistical Area (SMSA). In the regression equations economic conditions for SMSAs were represented by wage data and employment data. In addition to economic data, other factors, such as the presence of military personnel and the ratio of recruiters to male eligibles in an SMSA were represented by appropriate variables.

In defining regression equations three measures of enlistment behavior were used as dependent variables: enlistment rates, recruiter productivity, and the ratio of quality enlistees to total enlistees. Table 3 lists these variables and the major subgroups of male enlistees that were studied. Enlistment rate equations were also estimated for females and non-whites.

For each of the dependent variables four types of independent variables were identified as potentially influential in determining enlistment behavior: local job availability, local wages, Navy recruiting resources, and local demographic factors. The variables used to represent these factors are listed in Table 4. The dependent variables in Table 3 are numbered and the equation numbers on Table 4 refer to the equation in which an independent variable was included.

Statistical data representing each of the independent variables was collected and arranged in a single computerized data base. This data base was then used as a source for regression equation runs using the Statistical Package for the Social Sciences (SPSS). Data for SMSAs with a total population of

TABLE 3

DEPENDENT VARIABLES FOR MALE ENLISTMENT EQUATIONS

VARIABLE NAME	EQUATION	DEFINITION	DATA SOURCES
Enlistment Rate (high ability)[1]	1.a	1000 x enlistees / Eligibles	Enlistees: USAREC/MEPCOM (DMDC) Eligibles: 1) NCI County Population Estimates (Census) 2) Current Population Reports (Census) 3) Navy Recruiting District ASVAB test score distributions (Navy Recruiting Command) 4) SMSA High School Graduating Class of 1977 (Navy Recruiting Command)
Enlistment Rate (low ability)[2]	1.b		
Enlistment Rate (H.S. graduate)	1.c		
Enlistment Rate (H.S. dropout)	1.d		
Recruiter Productivity (high ability)	2.a	Enlistees / Recruiters	Enlistees: USAREC/MEPCOM (DMDC) Recruiters: Navy Recruiters by County (Navy Recruiting Command)
Recruiter Productivity (H.S. graduate)	2.b		
Ratio of High Ability Enlistees to Total Enlistees	3.a		USAREC/MEPCOM (DMDC)
Ratio of H.S. Graduate Enlistees to Total Enlistees	3.b		

[1] High ability was defined as an AFQT mental group score of I, II, or III upper.

[2] Low ability was defined as an AFQT mental group score of III lower or IV upper.

TABLE 4.

INDEPENDENT VARIABLES FOR MALE ENLISTMENT EQUATIONS

VARIABLE NAME	EQUATIONS	DEFINITION	DATA SOURCES
		ECONOMIC DATA	
Unemp	All	Aggregate SMSA Unemployment	Local Area Unemployment Statistics (BLS)
Lagged Unemp	1 a	SMSA Unemployment Rate Lagged Six Months	Local Area Unemployment Statistics (BLS)
Emp	All	Fraction of the total SMSA Population Who Are Employed	Local Area Unemployment Statistics (BLS) Current Population Reports.
Δ Unemp	All	$\frac{(\text{Unemployment}_t - \text{Unemployment}_{t-1})}{\text{Unemployment}_t}$	Local Area Unemployment Statistics (BLS)
Δ Emp	All	$\frac{(\text{Employment}_t - \text{Employment}_{t-1})}{\text{Employment}_t}$	Local Area Unemployment Statistics (BLS) Current Population Reports.
Wage	1a, 1b, 1c, 1d,	Average SMSA Wage in Manufacturing	Employment & Earning by Industry (BLS)
Expected Wage	1a, 1b, 1c, 1d, 3a, 3b	Wage (1 - Unemployment)	Employment & Earning by Industry (BLS) Local Area Unemployment Statistics (BLS)
Δ Wage	All	$(\text{Wage}_t - \text{Wage}_{t-1}) / \text{Wage}_t$	Local Area Unemployment Statistics (BLS)

TABLE 4. (Continued)

INDEPENDENT VARIABLES FOR MALE ENLISTMENT EQUATIONS

VARIABLE NAME	EQUATIONS	DEFINITION	DATA SOURCES
RECRUITING RESOURCES			
Recruiter Density	1a, 1b, 1c, 1d, 3a, 3b	Navy Recruiters / Male Eligibles	Navy Recruiters per county (NRC). NCI County Population Estimate (Census). Current Population Reports. Navy Recruiting Dist. ASVAB Test Score Distributions (NRC).
DEMOGRAPHIC AND GEOGRAPHIC DATA			
Military	All	Fraction of the SMSA Population on Active Duty	DOD Distribution of Personnel in U.S.
Non-White	All	Fraction of the Eligible Population who are Non-White	Estimates of U.S. Population by Counties & Metropolitan Areas (Census).
Highable	2a, 3a	High ability eligibles [1/] / Total eligibles	NCI County Population Estimates (Census). Current Population Reports (Census). Navy Recruiting District ASVAB Test Score Distributions (Navy Recruiting Command).

1/ Number of eligibles estiamted to be in AFQT mental groups I, II, and III upper.

TABLE 4. (Continued)

INDEPENDENT VARIABLES FOR MALE ENLISTMENT EQUATIONS

VARIABLE NAME	EQUATIONS	DEFINITION	DATA SOURCES
Lowable	16b	$\frac{\text{Low ability eligibles}}{\text{Total eligibles}}$ [2/]	NCI County Population Estimates (Census). Current Population Reports (Census). Navy Recruiting District ASVAB Test Score Distributions (Navy Recruiting Command).
Gradrate	2b, 3b	$\frac{\text{H.S. Graduate Eligibles}}{\text{Total Eligibles}}$	NCI County Population Estimates (Census). Current Population Reports (Census). SMSA High School Graduating Class of 1977 (Navy Recruiting Command).
Region K	All	Navy Recruiting Region dummy variables = 1 if SMSA is in Region K = 0 otherwise	SMSA vs. AFEES vs. NRD: NRD codes as of 1 Oct 77 (Navy Recruiting Command).
Highpop,	1a, 1b, 1c, 1d	SMSA size dummy variables Highpop = 1 if pop $\geq$ 500,000 Lowpop = 1 if pop $\geq$ 250,000	Current Population Reports (Census).

2/ Number of eligibles estimated to be in AFQT mental groups III lower and IV upper.

250,000 or more were selected and employed to create regression estimates for each of the dependent variables for males and females; whites and non-whites; high school diploma graduates and non high school graduates; and AFQT school eligibles (mental groups I thru III upper) and non school eligibles (mental groups III lower & IV upper). Equations for males were estimated for each of the three half year time periods from the second half of 1975 through the second half of 1976. Because of the low number of females and non-whites enlisting from each SMSA; only one time period was analyzed for these groups: the year 1976.

A. INDEPENDENT VARIABLES

This section explains the rationale for the inclusion of the independent variables of Table 4. The next section details the construction of the data base.

1. Economic Data

Under the heading of local economic influences on the SMSA enlistment rate there is the dual problem of identifying candidate variables and assessing their impacts. In performing the first part of this task, one is faced with a number of criteria that must be satisfied by an acceptable test variable. As with other variables included in the model, economic variables must take on different values across the sample SMSAs if they are to contribute to an understanding of variation in enlistment rates. Further they should reflect differences with theoretically justifiable relations to choice in a dynamic labor market. These considerations call for inclusion of variables listed in Table 4. While some of the wage variables in Table 4 were

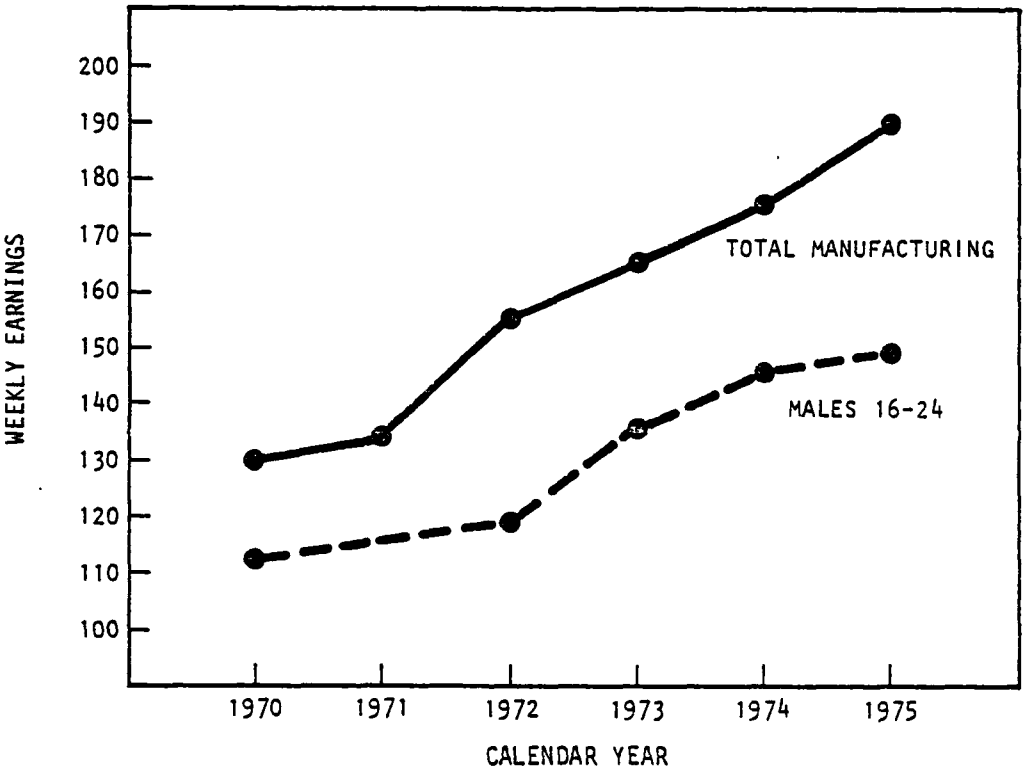
excluded from the final model because of problems with the quality of data (See Section B.2.b. below) a discussion of possible candidates and/or their available proxies is useful to both this and future studies.

a. Wages

Local wages represent the opportunity cost that a person sacrifices in order to enlist in the Navy. Since the Navy wage was constant regardless of geographic location, changes in the local civilian entry level wage might be taken to reflect the true changes in the relative attractiveness of enlistment: as the civilian wage rises, the Navy wage becomes less attractive. In this study local wages were represented by average weekly wages in manufacturing. On the local level, no data was available on a more appropriate opportunity cost variable, i.e. real entry level wages.

Before continuing this discussion, several qualifications must be made concerning the use of nominal weekly wage in manufacturing as the opportunity cost of enlisting. Historically, national average wages for young men appear to have been well correlated with wages in manufacturing (see Figure 1). However, two problems are encountered when substituting nominal wage in manufacturing for entry level wages for local areas. First, the wages used in this study were reported in nominal rather than real terms. Cost of living, as well as wages, would vary from SMSA to SMSA: and areas with high nominal wages may be areas with a high cost of living. Since SMSA cost of living deflators are only available for SMSAs with populations of one

ANNUAL TRENDS IN AVERAGE WEEKLY EARNINGS IN MANUFACTURING, COMPARED WITH INCOMES OF MALES 16-24 YEARS OLD: 1970-1975[1/]



[1/] U.S. BUREAU OF THE CENSUS, STATISTICAL ABSTRACT OF THE UNITED STATES (1976), PAGE 377.

Figure 1

million or more, it was not possible to correct wage data for cost of living influences. Secondly, even in real terms, wage in manufacturing may not be linearly related to entry level wages on a local level. Manufacturing wages may vary due to differing mixes of durable and non-durable manufacturing and differing degrees of unionization. The impact of these factors may be greater on the manufacturing wage than on the entry level wage. Minimum wage laws may be a binding constraint on entry level wages in some areas.

b. Job Availability

Several variables were identified as candidates for measuring the difficulty of finding civilian employment. These variables include unemployment, employment, and changes in these variables.

The unemployment rate of young workers, characterized by high turnover rather than great episodic duration [2/], is a reasonable proxy for the long search of new labor force entrants in search of stable employment. A high unemployment rate would be indicative of an unattractive job market. When civilian jobs are scarce, individuals will have an incentive to join the Navy for alternative employment.

Unemployment rate measures only the number of people who are out of work and who are actively looking for work and does not capture the extent to which, under prolonged high unemployment, people may become discouraged at the prospect of ever

---

[2/] Becker, G. "The Theory of the Allocation of Time," The Economic Journal, September, 1975.

finding a job and may leave the labor force entirely. Young people in particular have a lower level of labor force attachment.

To measure the extent to which this occurs, the fraction of the SMSA population employed was calculated for each of the time periods. Conversely, including both the unemployment and employment variables in the equation controls for the possibility of high unemployment associated with a growing job market. This phenomenon results in an expanding economy when the rate of increase in the labor force outstrips (at a point in time) the rate at which these new jobs can be filled. This is a temporary phenomenom, but nonetheless results in a high observed unemployment rate at a point in time.

The change in SMSA unemployment rate and change in employment act as proxies for the dynamics of the local economy. An increase in unemployment rate suggests declining job opportunities. Conversely, a declining unemployment rate suggests an improving job market and would likely reduce incentives for enlistments.

Like the wage data, job availability figures used in this analysis are local averages. While studies have shown that the teenage rate is substantially above the average [3] they also suggest that the relationship between them is relatively stable: all rates appear to move together, even though the teenage rate is the most volatile.

---

[3] Ibid.

2. Navy Recruiter Density

The density of Navy recruiting force for each SMSA is included in the regression equations to evaluate the impact of Navy recruiting resources on enlistments. One would expect that a high concentration of recruiters would indicate a high level of information about what the Navy has to offer in terms of jobs, wages and training opportunities among the eligible population.

3. Demographic and Geographic Data

Other variables in the equation include fraction already in the military, fraction of the eligible population who are of low ability, fraction of the eligible population in an ability group who are non-white, and Navy Recruiting Region dummy variables.

The fraction of the population in the military in a given SMSA is included to control for two factors. Individuals residing in SMSAs with large military populations may have formed either positive or negative preferences about military service, which in turn influence enlistment decisions. Also, in SMSAs with large military populations, the number eligible for Navy enlistment would be overstated because some of these individuals would already be in the military. In such SMSAs the enlistment rate as calculated would understate the actual Navy enlistment rate. The fraction of the SMSA population in the military variable was included to control for this effect.

The fraction of the SMSA eligible population who are low ability was used as a variable in the low ability enlistment rate equations to determine the tightness of the quota constraints on low ability enlistment rates. The Navy imposes some quotas and

guidelines on the quantity and quality of enlistees it accepts. In addition to limits on the total number of accessions, the Navy's goal was that 76% of their enlistees would be high school graduates and that 80% would be school eligible during 1976 4/. These goals could place a binding constraint on the number of people that were accepted from the population of non-high school graduates and low ability individuals. Since the rejection of a potential recruit from a quota group is a probabilistic function of the number already accepted from that group, it seems likely that a larger number of low education or low ability persons in the eligible population would lead to a lower enlistment rate for these groups.

Fraction non-white controls for the different enlistment propensities that the local minority population may have. Members of minority groups may face increasing discrimination in the civilian job market when unemployment is high. Hence, under the conditions of higher unemployment which characterized the time periods of this study, it was expected that minority enlistments would be high.

Navy Recruiting Region dummy variables were used to capture regional differences in enlistment behavior and to identify specific regions for further investigation.

4/ Conversation with LCDR Lavien and Mr. Henry Lipsie, July 25, 1979. (School eligible was defined as eligible for school under any of three criteria: AFQT group III upper or above, verbal plus mathematics score $\geq$ 100, or satisfactory scores on some of the specific aptitude sections.)

B. DATA BASE CONSTRUCTION

1. Dependent Variables and Stratification of Population

The following is an explanation of the calculation and data sources of the dependent variables: enlistment rate, recruiter productivity, and the ratio of quality enlistees to total enlistees. The data source for enlistees, and the partitioning of the enlisted population was identical for all three of these variables. Calculation of enlistees is defined in the description of the enlistment rate variable (Section II.B.1.a(1), below). The same definitions are not repeated in the sections detailing the calculation of the other dependent variables.

a. Enlistment Rate

The number of non-prior service individuals enlisting from a given SMSA by sex and race (white or non-white) was divided by the eligible population, aged 17-21, partitioned by race and sex, from that SMSA. Eligibles and enlistees were further partitioned by ability and education.

(1) Enlistees. The United States Army Recruiting Command/Military Enlistment Processing Command (USAREC/MEPCOM) file 5/ was the source of local Navy enlistment data. This file contains for each individual, demographic, educational, and mental ability information, as well as zip codes of the location of the individual prior to enlistment. Using the City Reference File conversion tape, 6/ the enlistees in each SMSA for each

---

5/ Contains information on all persons enlisting in any branch of the Armed Services. An extract containing only Navy enlistees was obtained from the Defense Manpower Data Center.

6/ Assigns county and SMSA codes based on zip codes. Obtained from the Bureau of the Census.

half year time period from the second half of 1975 through 1976 were computed. (Date of enlistment was based on "contract signed" date rather than date of entry.) Enlistments by SMSA and half year are further stratified by ability level as defined by Armed Forces Qualification Test (AFQT) mental group, and also by sex, race, and education (high school graduate or non-high school graduate). 7/ An enlistee was not included in the sample if he had scored below AFQT mental group IV upper, if he was a non-high school graduate with a mental group score of IV upper, or if there was no race information available. Female non-high school graduates were not included in the sample. (See Figure 2.)

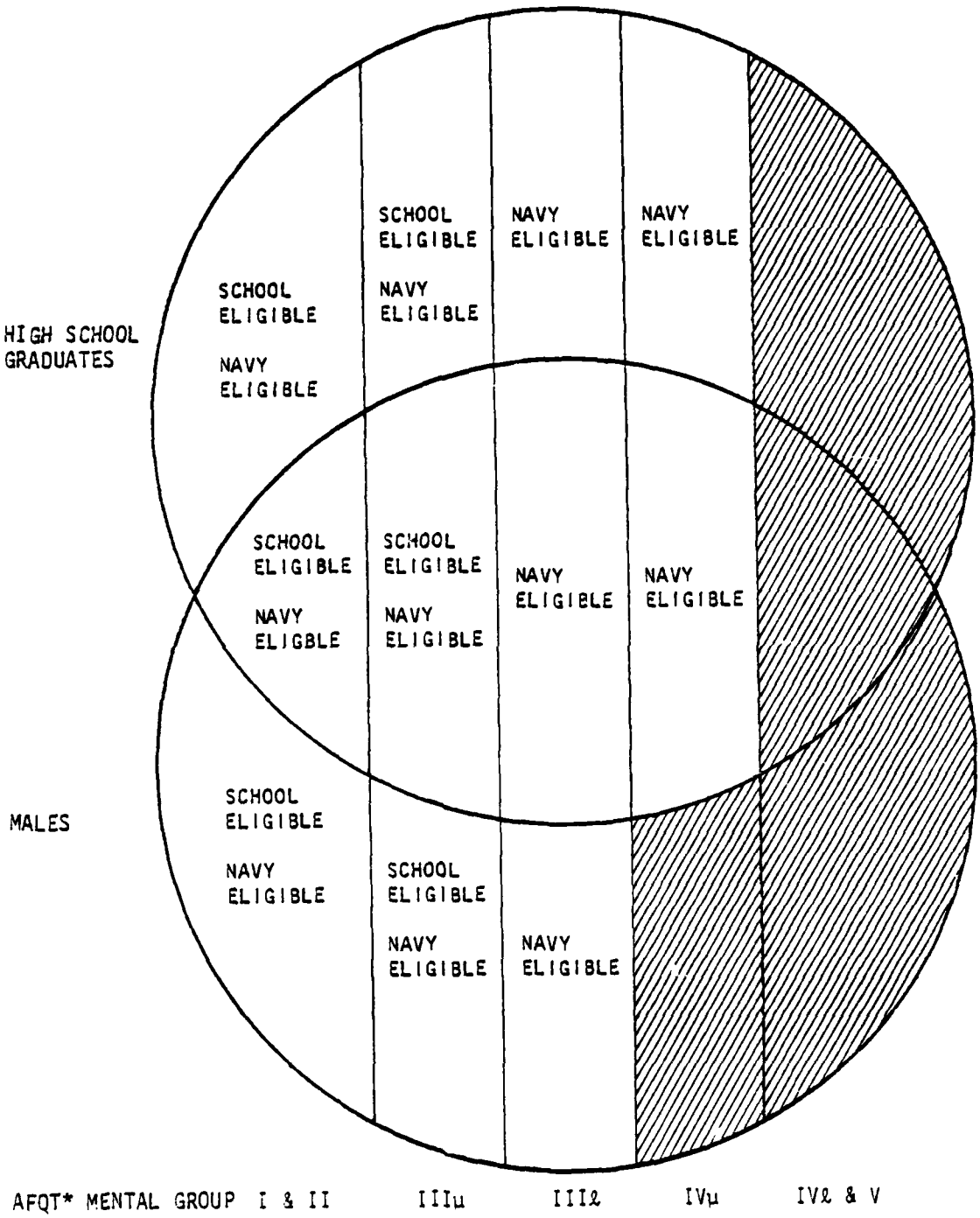
Beginning January 1, 1976, the test form given to enlisting Navy personnel was changed from the Basic Test Battery (BTB) to the Armed Services Vocational Aptitude Battery (ASVAB). As a result of this change in the test forms, mental groups were computed differently than in 1975, and a direct comparison by mental groups in 1975 and 1976 was not possible. To correct for this inconsistency, raw test scores in 1976 were used to reclassify those individuals who had taken the ASVAB test into mental groups in such a way that mental groups in 1976 correspond to those in 1975.8/

7/ Persons having General Education Development (GED) high school equivalency certificates were classified as non-high school graduates.

8/ Robert F. Lockman, Success Chances of Recruits Entering the Navy (SCREEN), Center for Naval Analysis, Arlington, Va., February 1977. Prior to January 1, 1976 mental groups were based on the following conversion from AFQT percentiles:

(Continued)

EDUCATION, AFQT GROUP, AND NAVY ELIGIBILITY



*ARMED FORCES QUALIFYING TEST

NOTE: Shaded regions refer to education and aptitude levels which are not sufficient for Navy eligibility.

FIGURE 2

b. Navy Eligibles

Since the absolute number of enlistments from an SMSA would be expected to be related to the size of the SMSA, the number of individuals eligible for enlistment were computed. An enlistment rate was then computed by dividing the number of enlistees by the number of eligibles.

The prime age for enlistments are the years directly following high school. Navy eligibles were computed by determining the SMSA population aged 17-21. The National Cancer Institute County Population Estimates by Age, Race, and Sex data file was the source of age distributions in SMSAs. In this file, population statistics are classified by age in five year increments

---

8/ (continued)

Mental Group	AFQT Percentile (based on 1975 Basic Test Battery AFQT percentiles - lower limit)
I	93
II	65
III U	49
III L	31
IV	21

After January 1, 1976, the computation of AFQT percentiles was changed because of a change in test forms resulting in a different classification of individuals by mental groups. For comparisons with mental groups prior to 1976, the following conversion of 1976 AFQT percentiles to mental groups was required:

Mental Group	AFQT Percentile (based on 1976 ASVAB 6&7 AFQT percentiles - lower limit)
I	94
II	67
III U	50
III L	35
IV	21

(for example, 0-4, 5-9, 10-14, 15-19, 20-24). The relevant age group for the analysis, 17-21 years, is not, however, identified in the available county age data. Since those 17-21 years old in 1975 and 1976 were 15-19 in 1973 and 1974, the fraction of individuals in this latter age group can be used to estimate the number of individuals 17-21 years old in each county in the specified periods.9/

For each year, 1973 and 1974, the percentage of individuals 15-19 years of age by SMSA was computed from the County Population Estimates by Age, Race, and Sex. Assuming SMSA age distributions to remain fairly constant over a relatively short period of time, these SMSA percentages for 1973 and 1974 were multiplied by the estimated 1975 and 1976 populations 10/ respectively. This product yields the estimated number of individuals 17-21 years of age in a given SMSA in 1975 and 1976. This estimation procedure is depicted by the following formula:

$$\text{Male Pop (17-21)}_{i,t} = \frac{\text{Male Pop (15-19)}_{i,t-2}}{\text{Pop (total)}_{i,t-2}} \times \text{Pop (total)}_{i,t}$$

Where t = current year

i = SMSA

Pop = number of individuals in the age group.

9/ It should be noted that some error is introduced by this procedure. In particular, migration of persons in the latter half of the defined age group (those 19-21) is not accounted for by the above method.

10/ From "Estimates of the Population of Counties and Metopolitan Areas: July 1975 and 1976," Current Population Reports: Population Estimates and Projections, U.S. Department of Commerce, Bureau of the Census, Series P-25, No. 739, November 1978.

The number of non-whites and females 17-21 years of age in each SMSA was estimated in a similar manner.

Eligibles in the SMSA are classified into mental ability categories based on high school ASVAB 5 test data obtained from the Navy Recruiting Command. The ASVAB 5 test is administered to high school students throughout the United States and scores on this test are used to classify high school students into mental groups corresponding to those used in the military. For each Navy Recruiting District, the percent of students in each mental group for the school year of 1977-78 was calculated for total males and non-white males. This percentage distribution in Navy Recruiting Districts is then used to estimate the number of 17-21 year old eligibles in each mental group for each SMSA. 11/ Female mental group distributions were based on ASVAB 5 data for the combined school years of 1976-77 and 1977-78. Navy Recruiting Region distributions were multiplied by SMSA female eligible populations to estimate female eligibles by mental group.

The male population of 17-21 year olds was partitioned into four ability groups: those estimated to be in mental groups I and II; those in mental group III upper; those in mental group III lower; and those in mental group IV upper. The men scoring in mental groups IV lower and V would not be considered qualified to join the Navy 12/ so no category was defined for

---

11/ All SMSA's in a Navy Recruiting District were assigned the district mental group distribution. Navy Recruiting District codes for SMSAs were assigned using "SMSA vs. AFEES vs. NRD", NRD codes as of 1 October 77. This data was obtained from the Navy Recruiting Command.

12/ Conversation with Mr. Henry Lipsie, Navy Recruiting Command Research Division.

these groups. Men estimated to be in either of these two groups based on the regional ASVAB distributions were subtracted from the total male eligible population. Women estimated to be in mental groups IV and V were subtracted from the female population aged 17-21.

The primary ability level cut-off for enlistees used in our analysis was that between AFQT mental groups III upper and III lower. Those enlistees who are in mental groups I, II, or III upper would be eligible for Navy training programs. The lower ability enlistees, those in mental groups III lower and IV upper, would not be eligible for training based on their AFQT mental group score but may be eligible for some specific training programs based on some combination of ASVAB special aptitude test scores.

Educational attainment of the eligible population by SMSA was estimated based on the size of the high school graduating class in each SMSA in 1977. 13/ For males and females the number in the class of 1977 was simply multiplied by five to estimate the total number of graduates in the 17-21 age group in 1975 or 1976. (The eligibles in 1975 would be expected to have graduated in the 5 year time period 1971-1975, and the eligibles in 1976 would have graduated in 1972-1976.) This procedure does not control for the possible differences in the number of people who would be of age to graduate from high school in the years

---

13/ Data was obtained from the Navy Recruiting Command.

from 1971 through 1976, and, more importantly, it does not take into account possible local fluctuations in the fraction of the age cohort who do complete school.

Non-high school graduates in an SMSA were estimated by subtracting the calculated number of high school graduates from the eligible population (those in mental groups I through IV upper).

Having calculated the numbers of enlistees for each demographic and ability group and having estimated numbers of eligibles in these groups; enlistment rates were calculated by dividing the number of enlistees from a cohort by the number of eligibles in that group within each SMSA.

2. Independent Variables

Four types of independent variables were tested for their impact on Navy enlistments: local job availability, local wages, recruiter density and demographic variables. This section presents the definitions and sources of these variables.

Local economic variables were obtained primarily from two sources: Employment and Earnings Statistics and Local Area Unemployment Statistics. The economic variables considered in the analysis were local unemployment, employment, change in unemployment and change in employment, weekly wage in manufacturing, change in wage, and expected wage.

a. Local Job Availability

The SMSA aggregate unemployment rate as well as the fraction employed serve as proxies for existing local economic conditions for persons seeking entry level jobs. The primary

source of employment and unemployment data was the Bureau of Labor Statistics (BLS) Local Area Unemployment Statistics file. 14/ This file contains monthly estimates of the aggregate number of persons in the labor force, number of persons employed, and number unemployed. This data is not specific to 17-21 year olds and separate employment estimates are not calculated by race or sex. For the purposes of this study it was assumed that a monotonic relationship existed between aggregate employment and unemployment estimates and the employment conditions experienced by the entry level labor pool.

To calculate local employment levels, a six month average of the BLS monthly estimates of the number of people employed in an SMSA was taken. This average was then divided by the SMSA population for the year. 15/ Local aggregate unemployment rate was defined as the average number of people unemployed divided by the average number in the labor force in that period.

The change in SMSA unemployment rate and change in employment act as proxies for the dynamics of the local economy. These variables were calculated by taking the percentage change between two half year time periods.

14/ Local unemployment and employment levels were missing from the BLS tape for all SMSAs in Illinois and Wisconsin, and for St. Louis for 1976. For these SMSAs employment data obtained from the Navy Recruiting Command were substituted.

15/ From "Estimates of the Population of Counties and Metropolitan Areas: July 1, 1975 and 1976." It was assumed that the SMSA population remained constant throughout a calendar year. Local employment for the first half of 1976 was divided by the average 1976 SMSA population and local employment for the second half of 1976 was divided by this same 1976 SMSA population.

$$\text{Employment} = \frac{\text{Employment}_t - \text{Employment}_{t-1}}{\text{Employment}_t}$$

$$\text{Unemployment} = \frac{\text{Unemployment}_t - \text{Unemployment}_{t-1}}{\text{Unemployment}_t}$$

Where:

t= current half-year period
t-1= previous half-year period

b. Local Wages

The Employment and Earnings by Industry data tape was the source of local wage information including weekly wage in manufacturing and change in wage. Monthly SMSA data, if available, was averaged into six month periods. Since the Bureau of Labor Statistics does not collect local earnings data for all SMSAs in our sample, average state wage information had to be substituted for local data for SMSAs not included on this BLS tape.16/

In addition to experimentation with average weekly wage, an expected wage variable was created. An eligible's perception of what his actual earnings will be would be lower than the appropriate entry level wage if he expects that he will be unemployed part of the time. Expected wage was defined as the

---

16/ SMSAs with population greater than 250,000 for which state wage data was used:

Augusta, Georgia
Colorado Springs, Colorado
Evansville, Indiana
Fort Wayne, Indiana
Lakeland-Winterhaven, Florida
Lexington-Fayette, Kentucky
Long Branch-Asbury Park, New Jersey
Lorain-Elyria, Ohio
Nassau-Suffolk, New York
South Bend, Indiana

amount of money a person would expect to receive if the anticipated employment for a fraction of time equal of the aggregate unemployment rate. Keeping in mind that the proxy variables, weekly wage in manufacturing and aggregate unemployment rate were substituted for the more relevant but unavailable variables (high school entry level wage and youth unemployment rates) expected wage (Ewage) was calculated as follows:

$$Ewage = (1.0-Unemployment) \times Wage$$

This variable was tested as an alternate specification of opportunity cost.

c. Recruiter Density

The Navy recruiting force density variable was based on monthly numbers of recruiters by SMSA for the years 1975 and 1976 17/ and the population of males estimated to be eligible for Navy enlistment. 18/ A six month average number of recruiters was divided by the annual average male eligible population. There is some question concerning the accuracy of the Navy recruiter data, particularly the number of Navy recruiters in Navy Recruiting Area 5 where the Recruiting Districts were reorganized several times in the period 1975-1976. It was believed that if errors in the recruiter data existed, they were in the form of under counting the actual number of recruiters rather than over counting them. 19/

17/ Obtained from the Navy Recruiting Command.

18/ Population of male eligibles was defined as in section II. B.1: men aged 17 through 21 who are estimated to be in AFQT mental groups I through IV upper.

19/ Conversation with Mr. Henry Lipsie of the Navy Recruiting Command.

d. Demographic and Geographic Variables

To control for the population characteristics of an SMSA, the fraction of the SMSA eligible population who are already in the military, the fraction who are non-white, the ability distribution of the eligible population, the geographic location of the SMSA, and the SMSA total population size were determined.

(1) Military. Fraction of the SMSA population in the military (FRACMIL) was calculated by summing the total number of persons in all service by county in 1975 20/ for all counties in an SMSA and then dividing by the 1975 SMSA population. 21/ Unfortunately, the Distribution of Personnel in the United States does not break the military population into age or race cohorts and so, in our study, no controls were made for the fact that the military population would primarily be a population of young adults, similar in age to the Navy eligible population, and possibly not reflective of the racial mix of the SMSA where they were stationed. Hence, the calculations of military personnel/SMSA population will have under stated the fraction of the 17 to 21 year old eligible population who were already in the military. This understatement in itself is not a serious problem as long as the age distribution of military personnel among SMSAs is similar. A more serious estimation problem arises if the age distribution varies across SMSAs.

20/ Office of the Secretary of Defense. Distribution of Personnel in the United States in 1975 Report #659.

21/ "Estimates of the Population of Counties and Metropolitan Areas: July 1, 1975 and 1976," Census.

(2) Non-white. The fraction of the SMSA eligible population who were non-white was estimated by calculating the fraction of the population who were non-white and 15 to 19 years of age 22/ in 1973 and 1974 and multiplying these fractions by the SMSA populations in 1975 and 1976 23/ respectively. This variable was entered into the male high school graduate, male non-high school graduate and female enlistment rate equations. Separate fraction non-white variables were calculated for high ability males and low ability males using the male non-white high school ASVAB test distributions by Navy Recruiting District. The fraction of the male non-whites in the ASVAB Sample scoring in AFQT mental groups I, II, and III upper was multiplied by the SMSA fraction of the 17-21 year old population who are non-white to estimate the fraction of the SMSA eligible population who are high ability non-whites. Similarly, the fraction of the non-white male ASVAB sample in a Navy Recruiting District who scored in mental groups III lower and IV upper was multiplied by the fraction who are both 17-21 years of age and non-white to estimate the fraction of low ability non-white Navy eligibles. The fraction of the eligible population who were high ability non-whites was entered into the high ability male enlistment rate equations and the fraction of the eligible population who were low ability non-whites was entered into the low ability male enlistment rate equation.

22/ N.C.I. County Population Estimates by Age, Race, and Sex.

23/ "Estimates of the Population of Counties and Metropolitan Areas", Census.

(3) Fraction Low Ability. The fraction of the SMSA eligible population who are estimated to be in mental group III lower or below, was used as a variable in the low ability enlistment rate equations to determine the tightness of the quota constraints on the enlistment behavior of quota groups. This was calculated by dividing the fraction of the ASVAB sample who were not school eligible by the total ASVAB sample for the Navy Recruiting District which contained the SMSA.

(4) Navy Recruiting Region Dummy Variables. Regional dummy variables, to control for different enlistment behaviors that are associated with differences in region of the country were defined for each Navy Recruiting Areas. SMSAs were assigned to Navy Recruiting Areas based on information which was obtained from the Navy Recruiting Command.

(5) Low Population and High Population. Dummy variables to control for the effects of being in SMSAs of different size were tested. An SMSA with a population of below 250,000 was defined as a low population SMSA and an SMSA with a population of above 500,000 was defined as a high population SMSA. Later in the analysis, low population SMSAs were removed from the sample, and the high population dummy, being consistently insignificant and with a coefficient very close to zero was dropped from the model.

C. REGRESSION EQUATIONS

The three types of equations listed on Table 3 are described in this section along with the primary cohorts which will be discussed in section III.

TABLE 5
ENLISTMENT RATE EQUATIONS

$$\text{ENLISTMENT RATE} = a_0 + b_1\,\text{UNEMP}_{i,t} + b_2\text{EMP}_{i,t} + b_3\text{CHGUNEMP}_{i,t} + b_4\,\text{CHGEMP}_{i,t} + b_5\text{CHGWAGE}_{i,t} + b_6\text{RECR}_{i,t} + b_7\text{FRACMIL}_i + b_8\,\text{FRACNW}_{i,j,t} + b_9\text{FRACLOWQ}_{i,t,d} + b_{10}\text{REG3} + b_{11}\,\text{REG4} + b_{12}\text{REG5} + b_{13}\,\text{REG7} + b_{14}\text{REG8}.$$

Where: i = SMSA
j = Ability Group
t = Time Period
d = Race or Sex Group

And the definitions of the independent variables are as follows:

UNEMP	Unemployment Rate
EMP	Employment Rate
CHGUNEMP	Change in Unemployment Rate; Period t-1 to t.
CHGEMP	Change in Employment Rate; Period t-1 to t.
CHGWAGE	Change in Manufacturing Wage; Period t-1 to t.
RECR	Recruiter Density
FRACMIL	Fraction of SMSA Population in Military
FRACNW	Fraction of Eligibles Who are Non-White.
FRACLOWQ	Fraction of Eligibles Who are in MG IIIL and IV.
REG3 (4-8)	Regional Dummy Variables; Regions 3,4,5,7,8;

NOTE: The reference region for the Regional Dummy variables was Region 1. Regression coefficients will indicate performance relative to that region.

1. Enlistment Rate

The basic equation for estimating enlistment rates is shown in Table 5. Enlistment rate equations were estimated for the following groups:

Male: school eligible (AFQT mental groups I, II and III upper)
Male: not AFQT school eligible (mental groups III lower and IV upper)
Male: high school graduates
Male: non-high school graduates
Female
Non-white: AFQT school eligible
Non-white: not AFQT school eligible

These are the primary groups that will be discussed in the next sections of this report.

SMSAs with a population of below 250,000 were not included in the sample because the number enlisting in a half year time period from these smaller SMSAs was too low for reliable analysis to be performed. In some cases there were less than five enlistees in some of the lower ability cohorts. This size cut-off reduced the sample size from 236 SMSAs to 132 SMSAs. The enlistment rate mean in the smaller SMSAs was very close in magnitude to the mean for larger SMSAs, but the variance was much larger. More importantly, there was no available data on number of recruiters in many of the smaller SMSAs and, hence, it was not possible to define the recruiter density variable. Since it was felt that this was a key variable in the analysis it made sense to place a lower limit on SMSA size in order to ensure that meaningful data on recruiter density was employed.

2. Recruiter Productivity Equations

Another measure of enlistment behavior is recruiter productivity. To determine the economic impacts on the average

TABLE 6
RECRUITER PRODUCTIVITY EQUATIONS

$$\text{RECRUITER PRODUCTIVITY} = a_0 + b_1\,\text{UNEMP}_{i,t} + b_2\text{EMP}_{i,t} + b_3\,\text{CHGUNEMP}_{i,t} + b_4\text{CHGEMP}_{i,t} + b_5\,\text{CHGWAGE}_{i,t} + b_6\text{FRACMIL}_i + b_7\text{FRACNW}_{i,j,t} + b_8\,\text{HIGHQ}_{i,d} + b_9\text{REG3} + b_{10}\text{REG4} + b_{11}\text{REG5} + b_{12}\text{REG7} + b_{13}\text{REG8}.$$

Where: HIGHQ is the fraction of the eligible population who are in MG I - MG IIIU. And the remaining variables are as defined in the Enlistment Rate equation.

number of high school graduate male enlistees per recruiter in an SMSA the model of Table 6 was tested. Recruiter productivity was defined as high school graduate enlistees/average number of recruiters and HighQ was defined as the fraction of the eligible population who were male high school graduates. 24/

Equations were estimated for male high school graduates and for male AFQT school eligible enlistees for the three time periods. Test equations were also estimated for total enlistees and for non high school graduates for the time period 1975/2.

3. Ratios of High Ability and High School Graduate Enlistees to Total Enlistees

A further test involved the impacts of economic factors on two sets of ratios: the ratio of male high school graduate enlistees to total enlistees and the ratio of AFQT school eligible enlistees to total enlistees. These equations show how the mix of enlistees would be affected by different levels of job availability and by different wage levels.

The model form for the ratio of school eligible enlistees to total enlistees is shown in Table 7. The equation for the ratio of male high school graduate enlistees to total male enlistees was almost identical. HighQ was redefined as the ratio of the high school graduates in the population of male eligibles to the total population of male eligibles and the dependent variable was defined as the number of male high school diploma enlistees to total male enlistees from SMSA, i, at six month time period, t.

24/ If there were no data for recruiters in SMSA, i, at time, t, then that SMSA was not included in the sample because recruiter productivity would be undefined. SMSAs not included for this reason were:

Des Moines, Iowa, Providence, R.I., Salt Lake City, Utah, South Bend, Indiana

TABLE 7
HIGH ABILITY RATIO EQUATIONS

$$\text{HIGH ABILITY RATIC} = a_0 + b_1 UNEMP_{i,t} + b_2 EMP_{i,t} + b_3 CHGUNEMP_{i,t} + b_4 CHGEMP_{,i,t} + b_5 CHGWAGE_{i,t} + b_6 RECR_{i,t} + b_7 FRACMIL_i + b_8 FRACNW_{i,t} + b_9 HIGHQ_{i,t} + b_{10} REG3 + b_{11} REG4 + b_{12} REG5 + b_{13} REG7 + b_{14} REG8.$$

Where: All variables are as previously defined.

D. COMMENTS OF THE EVOLUTION OF THE ANALYSIS

The dependent variables, enlistment rate, recruiter productivity, and ratio of quality enlistees to total enlistees, each represent different aspects of local enlistment behavior.

1. Enlistment Rate

While the enlistment decision is clearly binary for any individual, it is reasonable to interpret the local enlistment rate of his cohort as a probability of enlistment that applies to each individual in the presence of incomplete information. The purpose of the enlistment rate equations, then, was to identify some of the more important local economic determinants of this probability.

Since absolute number of enlistees would be expected to be related to SMSA size, it was felt that enlistment rate was a more useful measure of enlistment behavior than number of enlistees. Date of enlistment was defined as "contract signed" date rather than date of entry because it would be this earlier time period in which local economic conditions would have an impact.

2. Recruiter Productivity

Because of the consistent positive relationship observed between enlistment rates and recruiter density (See Section III C), and because local recruiter density is a variable over which the Navy has some control, recruiter productivity equations were estimated to identify local conditions under which Navy recruiters would be most effective.

3. Ratio Equation and Other Tests of Hypothesis 2

As mentioned earlier, it was hypothesized that there are two major reasons for joining the Navy. Some people join the Navy as an alternative to private sector employment and see their enlistment term in the Navy as a job. Others are primarily seeking to increase their human capital. These persons perceive enlisting in the Navy as an opportunity to gain relevant training and skills which they can later transfer to employment in the civilian sector. Training-oriented persons would be expected to be evaluating training opportunities such as could be found in colleges and vocational schools and elsewhere in the civilian sector (apprenticeship or on-the-job training) and those available in the Navy. Assuming that training opportunitites are not highly correlated with employment opportunities, one would anticipate that persons seeking training would be less sensitive to the rises or falls in the local job market.

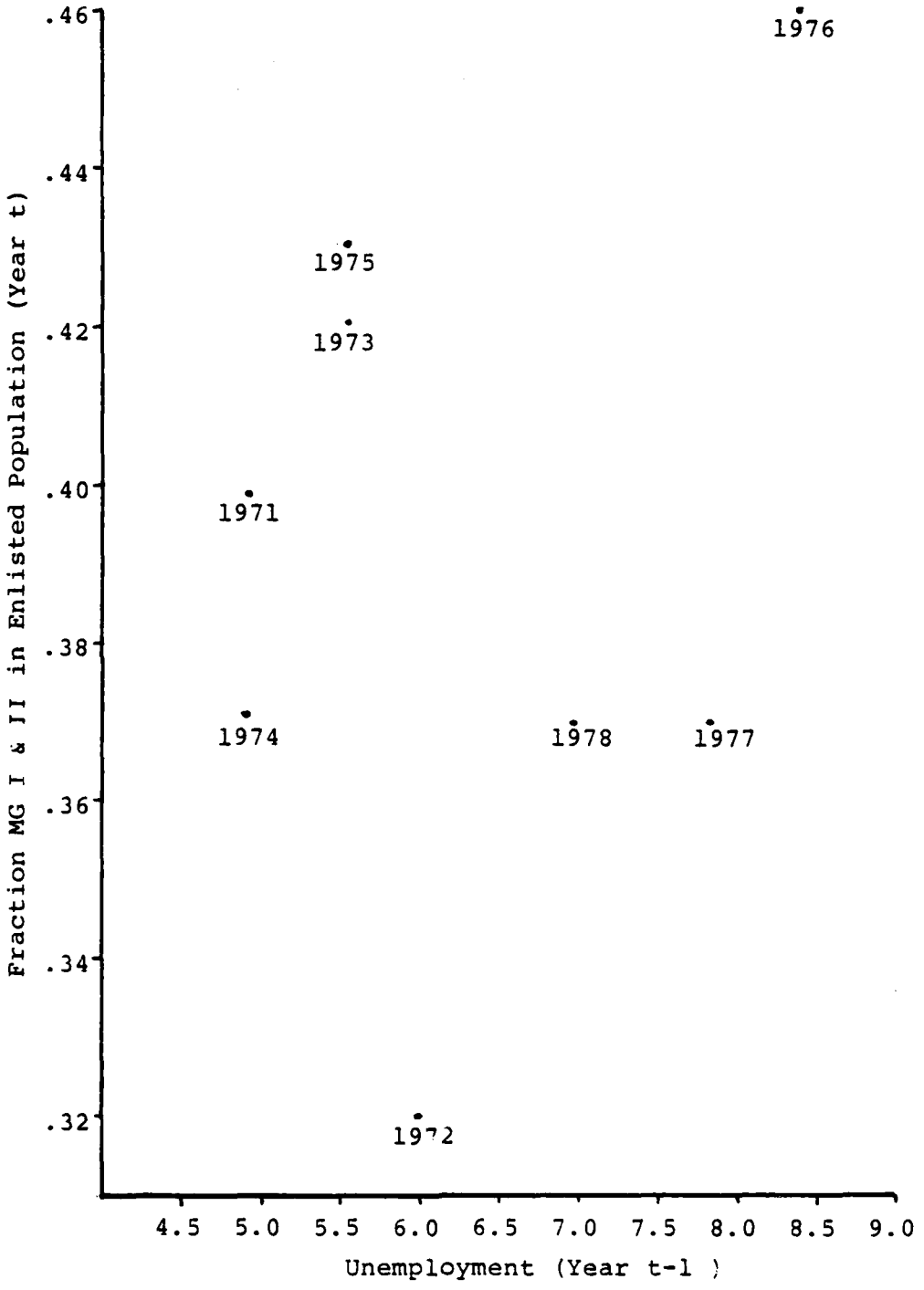
To test the hypothesis that training-oriented persons are less sensitive to local economic conditions, several assumptions were made concerning which segments of the male eligible population were likely to be training-oriented. There are two reasons for assuming that high ability persons (those in AFQT mental groups I, II, and III upper) are more training-oriented than the lower ability persons in mental groups III lower and IV upper. People scoring in mental groups III upper or above are eligible for Navy training programs. Many of those scoring below AFQT mental group III upper are not eligible although some may be granted eligibility based on other criteria. Since many of the

low AFQT mental group enlistees are not eligible for Navy training programs and since all of the high AFQT mental group enlistees are eligible for Navy schools, it was assumed that a larger fraction of those enlisting from the upper mental groups are enlisting to gain training than is true for the lower groups. In addition, the desire to undertake a training program is, in part, a function of the amount of effort that would be required to successfully complete the program. Lower ability persons would have to work much harder to complete a training program and would therefore, ceteris paribus, be somewhat less likely to choose to undertake training.

High school graduates are assumed to be more training-oriented on the average than non-high school graduates. High school graduates have already demonstrated a preference for continuing their education at least to the point of finishing high school and may be more likely to desire to continue their education and training. Further, high school graduates have, on the average, a higher aptitude than non-high school graduates so most training programs would be easier for them to complete.

A first test of this hypothesis involved creating national time series plots of the ratio of mental group I and II 25/ enlistees to total enlistees against national unemployment rates for the years 1970 through 1978 (Figure 3).

25/ In these time series plots, Mental groups I and II were chosen as the high ability group as opposed to mental groups I, II and III upper because within the timeframe 1970 through 1978; Navy policy changed several times regarding goals for percent AFQT school eligible.



LAGGED NATIONAL UNEMPLOYMENT RATE VS.
FRACTION OF ENLISTEES IN MG I AND II

FIGURE 3

Results of these plots were inconclusive although they seem to show a small degree of positive correlation between national unemployment rate and quality of enlistees.

Two further tests of hypothesis 2 involve comparisons of the behavior of high and low ability/education groups. First, as separate enlistment rate equations were estimated for AFQT school eligible, not AFQT school eligible, high school graduate, and non-high school graduate enlistment rates, a comparison of the size and significance of the coefficients yields information regarding how the mix of enlistees could be expected to change over the course of a local business cycle. Secondly, the ratio of high ability/education enlistees to total enlistees equations were estimated. Hypothesis 2 indicates that these ratios should be positively related job availability and wages. For example, as unemployment increases, job-oriented individuals would enlist in greater numbers relative to training-oriented individuals. Hence, high unemployment would be expected to be associated with low ratios of training oriented enlistees to total enlistees.

A problem associated with the above-mentioned tests of Hypothesis 2 is that the Navy prefers to recruit high ability and high education individuals and has guidelines and quotas regarding the maximum percent of non-high school graduates and non-school eligibles it will accept. Further, if a deterioration of economic conditions occurs, Navy recruiters are faced with larger numbers of all quality levels of persons who wish to enlist and are put into a position where they can be more selective in who

they accept. 26/ Evidence relating to Hypothesis 2 would tend to be obscured by Navy recruiting policy. It is still useful, however, to estimate the economic impacts on the quality mix of enlistees. Most of the discussion of results of the ratio equations will concern this quality mix rather than the training-oriented vs. job-oriented hypothesis.

The primary focus of the following section of this study was on the enlistment of males. This decision was made for two reasons. First, Navy entry qualifications are higher for women than for men. While men could enlist whether or not they were high school graduates and with an AFQT mental group score as low as IV upper; women must be high school graduates. Second, enlistments of women were tightly constrained by quotas during the time period studied. Therefore, inclusion of women in any of the three types of equations would tend to obsure any relationship which may exist between local factors and enlistment behavior, and reflect instead Navy policy decisions. Although a separate enlistment rate equation was estimated for women, the discussion in Section III is primarily focused on male enlistments.

26/ Grissmer, D.W., The Supply of Enlisted Volunteers in the Post Draft Environment, found elasticities of unemployment rate to be positively related to quality of enlistees. High unemployment brings in increasing numbers of high quality enlistees (both AFQT mental group I, II, and III and high school graduates) so the services accept a lesser number of the low quality group. See also Toikka, Richard S., Determination of the Quality of Navy Recruits, 1977.

III. ANALYSIS OF RESULTS

The objective in this section of the report is to present an analysis of the results of the procedures described in the preceding section. Since the purpose of this study was to examine the influence of a number of different variables on the outcome of the recruiting process from a local view point, the discussion which follows is keyed to those variables. Thus, the subsections which follow will discuss economic variables, recruiter density, and demographic/geographic variables. Following this, the general conclusions with regard to the two hypotheses adopted at the beginning of the study will be discussed and an overall summary of the findings presented.

Because of the large number of regression runs made in connection with this study, it was felt that introducing tabulations of results in the course of the discussion would be more confusing than helpful. Therefore, results for all regression runs were tabulated in a standard format, indexed, and compiled in Appendix A of the report. Where necessary for clarity appropriate data has been extracted from these tables, annotated, and included in this section.

Econometric analysis of economic and demographic variables influence on SMSA specific enlistment rates has provided evidence of a number of important relationships. While none is surprising in the light of theoretic expectations, they do serve two valuable functions: describing a first approximation of economic determinants of local enlistment behavior and laying the groundwork for future investigations of such questions.

Broadly put, the statistically significant results fall into the following categories:

- The dominant effect of measures of job availability (unemployment, lagged unemployment, employment, and changes in these measures)
- The apparent unimportance of local wage-related variables
- The influence of local recruiting force size
- The effect of large minority components in the local population
- Regional differences not accounted for by the other variables

A. JOB AVAILABILITY

In the context of fluctuating national economic conditions and various changes in military policy regarding veterans benefits (principally educational benefits) which occurred in the period 1975 through 1976, it appears that Navy enlistment rates, recruiter productivity, and the educational mix of enlistees are related to measures of job availability.

1. Unemployment

a. Enlistment Rate Equations

In particular, SMSA aggregate unemployment rate had a positive influence on enlistment rates for all cohorts of male eligibles (see Tables A3-1, A4-1, A5-1, and A6-1, Appendix A). Unemployment rate coefficients were significant or very close to significant and similar in magnitude within cohorts for all time periods. Elasticities of enlistment for AFQT school eligibles with respect to unemployment for the three time periods were

.259, .219, and .308. Assuming that the teenage unemployment rate was a reasonably stable linear transformation of the average rates over the observed data points, 27/ it would appear that we can draw two important conclusions: 1) that the unemployment rate, as a proxy for the difficulty of finding acceptable employment, is a controlling variable in determining SMSA enlistment rates; and 2) that the point elasticities estimated from the model essentially are the same as those that could have been calculated using teenage unemployment rates.

It should be noted that enlistment rates equations for 1975 did not initially show the strong relationship between enlistment rates and economic variables which was evident in the 1976 equations. Examination of data revealed four outliers (Lansing, Michigan; West Palm Beach, Florida; Miami, Florida; and New Orleans, Louisiana) which had unemployment rates in excess of ten per cent and enlistment rates less than half the national average. These outliers were removed from the 1975/2 sample and a second regression estimate made. Table 8 shows the regression results with and without these outliers.

2. Lagged Unemployment

Regression results using unemployment rates which were lagged one period instead of current unemployment rates were similar to results using current unemployment.

27/ R. Hall, "Rigidity of Wages and the Persistance of Unemployment," and Marston, "Employment Instability and High Unemployment Rates," Brookings Papers on Economic Analysis, 1976.

TABLE 9
COMPARISON OF COEFFICIENTS (F-STATISITCS)
FOR MALE AFQT SCHOOL ELIGIBLE ENLISTMENT
RATES IN 1975/2 WITH AND WITHOUT
FOUR OUTLIERS[1]

	1975/2	1975/2 OUTLIERS REMOVED
CONSTANT	+3.58* (3.11)	+2.58 (1.57)
UNEMPLOYMENT	+7.56 (0.97)	+14.96* (3.55)
EMPLOYMENT	-.97 (0.06)	-.16 (0.00)
ΔUNEMPLOYMENT	+1.98 (2.24)	+1.97 (2.30)
ΔEMPLOYMENT	+5.67 (0.44)	+4.24 (0.25)
ΔWAGE	+2.53 (0.31)	+3.92 (0.72)
RECRUITER DENSITY	+2300.00*** (7.73)	+2110.00*** (6.69)
MILITARY	-2.25 (0.07)	-2.51 (0.10)
NON-WHITE	-11.12*** (14.63)	-10.53*** (13.07)
REGION 3	+.71* (3.04)	+.95** (5.14)
REGION 4	+.52 (1.94)	+.67* (3.17)
REGION 5	-.30 (0.38)	-.17 (0.12)
REGION 7	+1.60*** (9.84)	+1.74*** (11.05)
REGION 8	+1.11** (6.43)	+1.09** (6.49)
R^2	.33	.34

1/ LANSING, MIAMI, NEW ORLEANS, AND WEST PALM BEACH

TABLE 9

COEFFICIENTS (F-STATISTICS) FOR UNEMPLOYMENT AND LAGGED UNEMPLOYMENT (MALE AFQT SCHOOL ELIGIBLE)

	1975/2	1976/1	1976/2
Current Unemployment	+14.96	+12.44	+18.68
	(3.55)	(2.72)	(4.77)
Lagged Unemployment	+12.96	+11.30	+20.68
	(3.15)	(2.32)	(6.18)

Complete regression results for the male AFQT school eligible equations with lagged unemployment are in Appendix A Table A3-5. As might be expected from the above coefficients, elasticities associated with lagged unemployment were very close in magnitude to those associated with current unemployment ranging from .234 to .362.

This apparent reaction to unemployment in the recent past may be due to the high degree of correlation between the two unemployment rates [28]. Also, perceptions of current job availability may have been formed by experiences in the recent past.

3. Employment

Employment levels, representing another facet of job availability were occasionally significant and negatively related to enlistment rates. In particular, a relationship between the fraction of the SMSA population who were employed and enlistment

---

[28] Correlations

	Unemp 1975/2	Unemp 1976/1	Unemp 1976/2
Unemp 1975/1	+.92		
Unemp 1975/2		+.90	
Unemp 1976/1			+.96

rates existed for the male high school graduates and for the non-white AFQT school eligible groups. This variable measures the extent to which persons become discouraged at the prospect of ever finding a job in depressed times and, hence, drop out of the labor force. Or conversely, in a rapidly growing economy, people living in an SMSA may decide to enter the labor force and people from other areas may migrate to this SMSA, encouraged by the many available opportunities. Neither of these phenomena are captured by the unemployment variable which measures only the fraction of the labor force who do not have a job and who are actively seeking work.

4. Change in Unemployment/Change in Employment

Change in employment and change in unemployment were, in some time periods, related to enlistment behavior for males including the high school graduates, non-high school graduates and the high ability cohort (Tables A5-1, A6-1, A9-4). These variables reflect the dynamics of job availability in a local economy. Worsening conditions, as reflected by rising unemployment rates or falling employment levels, seem to give young people an incentive to join the Navy. Conversely, an improving economy would be associated with low local enlistment rates.

In general, the variables measuring change in the availability of employment appeared to be less related to enlistment rates than the unemployment rate in the current period. Unemployment rate was usually entered into the equation before any of the other economic variables in the stepwise regressions and was most frequently significant in the final equations. (See Tables A3-4 through A3-6 and A4-4 through A4-6.)

Correlations between these economic variables, although not severe, may have obscured some of their relationships with enlistment. On a national level, the correlations between unemployment and change in unemployment were weak, as were the correlations between employment levels and change in employment levels. Fraction employed and unemployment rate were negatively correlated to a moderately high degree. This was also true and even more pronounced for change in employment and change in unemployment. 29/ The fact that many of these measures are correlated with each other is not surprising. However, as stated in section II, all variables were included rather than just the unemployment rate so that a more accurate picture of the local job opportunities available to a potential enlistee could be described.

5. Local Job Availability and the Ratio of Quality Enlistees to Total Enlistees

In an effort to find the determinants of the quality mix of enlistees, the influence of economic variables on the ratio of high school graduate enlistees to total enlistees was investigated. Results for these equations are presented on Table A9-4. The positive relationship observed between unemployment and the ratio of high school graduate enlistees to total enlistees in 1975/2 and 1976/1 and the negative relationship between

---

29/ Correlations between job availability variables: 1976/1

Employment	-.49559		
ΔUnemployment	.20162	-.11300	
ΔEmployment	-.02331	-.00729	-.58322
	Unemployment	Employment	ΔUnemployment

employment and this ratio in 1976/2 indicate that, in SMSAs where job search is difficult, the Navy can expect the educational attainment of their recruits to be higher. However, the effect was small (see Table A9-5). For example, the unemployment elasticity obtained for 1975/2 was .087 indicating, for a 1% change in unemployment rate, a change in the quality ratio of a few hundredths of a percent.

It seems unlikely that high school graduates would have more difficulty obtaining a job than high school dropouts since one would think that a high school diploma would be a symbol of drive and ambition in the civilian job market just as it is to the Navy. What may be at work, here, is the effect of increased recruiter selectivity in times of high unemployment and relaxed standards for enlistments when good opportunitites exist in the local job market and it appears that a recruiter will not be able to meet his overall goals. Although the gap between the ease with which a high school graduate and a non-high school graduate can find a job may widen in times of poor economic conditions, a high school graduate would still be expected to experience more trouble finding a suitable civilian job in times of bad conditions than in good times. Since recruiters are constrained by maximum total numbers which they can enlist and since it may appear to be easy to meet the total recruiting goals by recruiting more highly educated enlistees, recruiters may turn away the many non-high school graduates who desire to enlist.

Thus it appears that as economic conditions deteriorate, not only can the Navy expect a higher total enlistment rate but they can also expect the educational level of their average

recruits to improve. No conclusive findings were made regarding the effects of economic conditions on the aptitude level of these enlistees.

B. WAGE VARIABLES

In general, expected relationships between wages and enlistment rates were not evident in the results. The work of J. R. Hicks 30/ and others has suggested that wage considerations are considerably less important to the new labor force entrant than is the observed difficulty of finding a job. It should not be too surprising, then, to find that in the estimated equations job availability measures rather than wages were dominant.

Wage coefficients were insignificant in the enlistment rate equations for all cohorts for both time periods of 1976 and were significant with an unexpected positive sign for male AFQT school eligibles in 1975/2. The use of an expected wage variable (see section II.B.2) did not improve results.

TABLE 10

EXPECTED WAGE COEFFICIENTS/(F-STATISTICS)
MALE REGRESSION EQUATIONS

	Time Period		
MALES	1975/2	1976/1	1976/2
AFQT School Eligible (Males)	+0.01 (4.26	+0.00 (1.16)	+0.01 (1.98)
Not School Eligible (Males)	-0.00 (0.05)	+0.01 (2.54)	+0.01 (1.11)

Complete regression results for these equations are presented in Appendix A, Tables A3-7 and A4-7.

30/ The Theory of Wages, Chapter IV.

Change in wage was significant and had the expected negative sign in the recruiter productivity equations for both high school graduates and high ability males in 1976/2. This may indicate that, in times of an improving national economy, enlistment behavior is sensitive to future wage expectations.

One possible explanation of the apparent lack of impact of wages on enlistment rates can be found in the literature on job search theory. The minimum acceptable wage offer (reservation wage) to an individual who is looking for employment may well be sensitive to both the mean of the expected wage distribution and to its expected standard deviation. As either of these statistics is increased in magnitude the reservation wage rises. The implication, then, is that the dispersion of entry level wages could act in such a way as to offset the effects of a rise in the mean wage on the reservation wage. If an increase in the demand for secondary market labor acts so as to raise the lowest wages first, then the range of offers would contract and counteract the effect of the rise in the mean. This is not to say that the increasing average wage should not, ceteris paribus, reduce enlistment rates. If, however, it is accompanied by a decrease in the spread of relevant wage offers, the mean wage effect may be obscured.

While the foregoing theory may explain the lack of a significant relationship between local wage differentials and enlistment behavior in 1975/76, it does not imply that national relative wages are not influential in determining enlistments over time. From 1975 through the present there has been a steady rise in national wages at a rate of nine to ten percent per year. At

the same time military wage increases have been held to 5.5 percent per year. Thus the mean expected wage has been rising and the dispersion has also been increasing, influenced on the low side by the wage rate of primary interest to the potential recruit. As the military-civilian entry level wage differential continues to grow on a national level one would expect that eventually it would become a significant determinant of enlistment behavior. Because the national wage gap has grown the role of local relative wages may well have changed due to the dispersion effect mentioned above.

C. RECRUITER DENSITY

Recruiter density refers to the ratio of the number of recruiters to the number of eligibles. This variable consistently displayed a significant positive relationship to enlistment rates. Examination of the elasticities associated with the recruiter density variable over the range of cohorts and time periods encompassed by the study reveals a fairly narrow range of values.

TABLE 11

ENLISTMENT RATE EQUATIONS
RECRUITER DENSITY ELASTICITIES

	Time Period		
Cohort	1975/2	1976/1	1976/2
AFQT School Eligible	.1249	.1511	.1196
AFQT Non-School Eligible	.1888	.1095	.1160
High School Graduates	.1358	.1628	.1057
Non-High School Graduates	.2187	.1039	.1706

1. Underlying Relationships

Aside from its value as an indication of the effectiveness of the level of recruiting effort there are a number of collateral effects which recruiter density may be capturing.

Recruiter density may act as a proxy for the availability of information on Navy opportunities to potential recruits. Similarly, a large number of recruiters in an SMSA suggests an increase in the number of recruiting offices. Physical proximity of a recruiting office reduces search costs and makes enlistment more probable.

The recruiter density variable may also reflect local advertising efforts. Arima 31/ observed a weak positive correlation between number of Navy recruiters per eligible population and dollar expenditures on the local advertising (LAMS) program per eligible population. Further, he found LAMS expenditures to be positively related to local enlistment rates.32/ To the extent that LAMS expenditures and recruiter density were correlated in our time periods, the recruiter density coefficient may also be reflecting differences in the amount of local advertising in school newspapers, telephone yellow pages, and mail outs from local recruiters.

There is also the possibility that Navy Recruiting Command policy decisions with regard to recruiter deployment are self reenforcing with respect to recruiter performance. If there

---

31/ Arima, J. Advertising Budgets, Advertising Effectiveness, and the Navy's Recruiting Advertising Program, Table 12, page 6. Correlation between LAMS expenditures per QMA and canvassers per QMA was 0.24.

32/ Ibid, page 52.

is a tendency for billets to be readjusted over time so as to take advantage of realized enlistment rate differences across SMSAs then the result would be that canvassing efforts would be correlated with lagged enlistment rates which, in turn, could be highly correlated with the current rate. This effect would be captured by the recruiter density coefficient.

2. Recruiter Productivity

To assess the effectiveness of recruiters under varying economic conditions, equations for recruiter productivity were estimated. (Recruiter productivity was defined as the average number of enlistees per canvasser for the SMSA.) The results are shown in Tables A8-1 and A8-3, Appendix A.

For both the high ability and the high education groups, recruiters were more effective in areas where unemployment rate was high. Further, the elasticities indicate that this effect is rather large.

TABLE 12

RECRUITER PRODUCTIVITY EQUATIONS
UNEMPLOYMENT RATE ELASTICITIES

Cohort	Time Period		
	1975/2	1976/1	1976/2
AFQT School Eligible	.6639	.7443	1.0554
High School Graduates	.6407	.7055	.9775

One of the functions of a recruiter is to inform the eligible population about Navy opportunities. A recruiter's message, regarding alternative employment, training, and open-ended careers in the Navy would be particularly welcome to teenagers who are facing limited opportunities in their local job market.

This finding, that unemployment rates are related to recruiter productivity, may have important management implications. In the time periods of this study, the correlation between local unemployment rates and recruiter density was low; in fact it was slightly negative.

TABLE 13

CORRELATION COEFFICIENTS BETWEEN UNEMPLOYMENT AND RECRUITER DENSITY

	Unemployment		
Recruiter Density	1975/2	1976/1	1976/2
1975/2	-.09895		
1976/1		-.10259	
1976/2			-.07605

It seems therefore, that local job availability was not a criterion for decisions regarding the geographic placement of Navy recruiters and that resource efficiency could be improved if more recruiters were placed where unemployment is high.

D. DEMOGRAPHIC AND GEOGRAPHIC VARIABLES

Variables included in this category are the fraction of the SMSA eligible population which was non-white, the fraction of the SMSA population in the military, and a set of regional dummy variables. Significant effects on enlistment rates with respect to each of these variables are apparent.

1. Fraction Non-White

The fraction non-white variable was associated with low enlistment rates for both high school graduate males and non-high school graduate males. The Navy has historically had a relatively low non-white population and, until the recent past,

there was a tendency to place minority groups in stereotyped occupations. These general perceptions were undoubtedly reenforced during the 1975-1976 time period by the national media attention given to racial disturbances aboard Navy ships in the 1973-1974 period. Thus, the observed results probably reflect the fact that minority groups are more difficult to recruit and that the Navy was devoting a significant recruiter effort to achieve better minority representation at the expense of lowered overall enlistment rates.

The influence of the fraction non-white variable was particularly noticable with respect to enlistment rates for high ability male enlistees. Increasing values of the variable had an extremely depressing effect on high quality enlistment rates. In fact, the coefficient of the variable was so large as to indicate that a one percent increase in the fraction non-white in the eligible population would be associated with a slightly larger than 1% reduction in high quality enlistment rates. For low ability enlistments there was no apparent relationship between fraction non-white and enlistment rates.

The fraction non-white variable was also associated with depressed high ability non-white enlistment rates. That is, non-white high ability enlistment rates were highest in SMSAs where the fraction of the eligible population who are in minority groups is low. In spite of this the average non-white high ability enlistment rate over all SMSAs was not extremely low. In fact it was nearly as high as the overall male enlistment rate. However, this average appears to be made up of high

non-white enlistment rates for SMSAs with low non-white population and low non-white enlistment rates for SMSAs with large non-white populations. It would appear that the presence of a large non-white fraction in the population of an SMSA presents a difficult recruiting climate for the Navy.

That non-white high ability persons would have low enlistment rates is not particularly surprising. Affirmative action programs offer many special opportunities for education and employment to high ability members of minority groups. Special apprenticeship programs and a relatively large number of college scholarships and financial aid programs provide a rich variety of alternatives, while the Navy has no special programs targeted to these groups. Furthermore, the alternatives are probably better advertised and more readily available in areas with high concentrations of minorities which would tend to explain the distribution of high ability non-white enlistment rates.

2. Fraction Military

The fraction of the SMSA population who are already in the military appeared to be positively related to the high quality enlistment rate from that SMSA. (See Tables A9-1, A9-2, A9-4, A9-5.) It was significant and positively related to the ratio of high school graduates to total enlistees and also to high ability enlistees to total enlistees. In one time period, 1975/2, it was associated with depressed enlistment rates for low ability males. This variable was included in the equation for two reasons. First, in some SMSAs the fraction of the SMSA who are

in the military is very large, as high as 23% in one instance. Since this military population is composed largely of persons in the eligible age group the numbers of enlistment eligibles in an SMSA could be greatly overstated and hence, the enlistment rates could be understated. Second, military presence may cause people's awareness of the military to increase and their perceptions of the military to improve. Since the quality of enlistees was shown to be higher in areas where military population is large, it appears that the second of these possibilities may be true.

Exposure to the military may increase people's awareness of the military (including the Navy) as a career option. If the Navy is perceived as an attractive option and many people wish to enlist, then the recruiter can be more selective. Alternatively, perceptions may be enhanced to a greater degree in high school graduates than in non-high school graduates. The military, particularly the Air Force and the Navy, are very selective in their enlistment criteria. 33/ All services prefer high school graduates and have limits on the percentage of non-high school graduates they can accept. If the enlisted persons do associate with civilians in an area, they may be likely to associate with young persons with education and ability similar to their own. High school graduates may therefore have more direct exposure the military than non-high school graduates.

33/ Arima, J., A Systems Analysis of Navy Recruiting.

3. Regional Effects

Enlistment rates varied significantly among geographic regions. Table 14 gives the averages for school eligible and non-school eligible enlistees for all three time periods.

TABLE 14

MEAN ENLISTMENT RATES BY REGION

	Recruiting Region					
	1	3	4	5	7	8
School Eligible	.00410	.00488	.00427	.00410	.00556	.00468
Non School Eligible	.00471	.00357	.00433	.00503	.00503	.00524

Regional dummy variables in all equation sets show that there are significant regional differences in enlistment behavior not captured by the other economic and demographic variables. High ability individuals from Region 3 and Region 7, which cover the south and southwest sections of the country, appear to have a somewhat higher propensity to enlist. School eligible enlistment rates are generally higher and the regional dummy variables are significant and influential in these equations.

It seems likely that these dummy variables are capturing a portfolio of region related influences. Among these are the availability and quality of academic and vocational educational institutions, peer group labor force attachment, and differences in job quality not captured by wage data.

There was an indication that the enlistment behavior of high ability males may be sensitive to the availabilty of higher education in his area. Although no regressions were run containing a variable for the availability of higher education in a

person's hometown, regional dummy variables for AFQT school eligible males were compared to the expenditures on institutions of higher education per 18-20 year old population (see Table 15). It appears that the greater the expenditure per individual on higher education in a high abilty person's region, the less likely he will be to enlist. A person with little other opportunity for advanced education may be more likely to consider the Navy either as an immediate training opportunity or in order to take advantage of the educational benefits which he will receive after he completes his first term. Low ability enlistment rate equation dummy variables were also compared with educational expenditures (see Table 16). The relationship observed between regional enlistment behavior for high ability enlistments and educational expenditures in that region did not seem to hold true for the regional dummy variables in the low ability equations.

In addition to education opportunities, regions vary in the quality of jobs available to entry level workers. The predominantly urban and industrialized Northeast and Midwest presents a much different set of entry level opportunities to the teenager than the predominantly rural, agricultural South and Southwest. If prospects for advancement and training in a local market are poor, the mobility associated with Navy enlistment becomes more attractive. The steady employment and training offered constitute a way out of the local labor force.

There is one incidental finding uncovered in the course of the study of which recruiting managers should be aware. In partitioning the population into mental group cohorts, the number

TABLE 15

EDUCATIONAL OPPORTUNITIES
AND REGIONAL DUMMY VARIABLES
FOR SCHOOL ELIGIBLE MALES

	Education Expenditures[1] / 18-20 Population[2]	Regional Dummy Coefficients (When Significant)		
		1975/2	1976/1	1976/2
Region 1	2,725	X	X	X
Region 8	2,623	+ 1.09		
Region 5	2,402			+ 2.10
Region 4	2,045	+ .67		+ 1.33
Region 3	1,760	+ .95	+ .90	+ 2.51
Region 7	1,673	+ 1.74	+ 1.08	+ 2.34

Note: Educational expenditures and population data were by state. When Navy Recruiting Region borders cross state lines, the state was classified as being in whichever Region contained the majority of the state's population.

---

[1] U.S. Bureau of the Census, Statistical Abstract of the United States (1976), Table 243: "Institutions of Higher Education - Value of Plant, Current Fund Income, and Expenditures, States and Other Areas: 1973", p. 145.

[2] Ibid. Table 29: "Population by Age: States: 1975", p. 28

TABLE 16

REGIONAL DUMMY VARIABLES FOR
NON-AFQT SCHOOL ELIGIBLE MALES

	Education Expenditures / 18-20 Population	Regional Dummy Coefficients (When Significant)		
		1975/2	1976/1	1976/2
Region 1	2,725	X	X	X
Region 8	2,623			
Region 5	2,402			+ 1.74
Region 4	2,045	- .69		
Region 3	1,760	- 1.93		
Region 7	1,673			+ 1.50

of eligibles in each mental group was estimated in the same way that the Navy Recruiting Command makes such estimates. That is, local ASVAB test score distributions were used to establish the number of eligibles in each of the AFQT mental group percentiles. There was some concern over this procedure because the ASVAB test was voluntary and was not universally taken by high school students. Further, the percent of the eligible population who took the test was highly variable from city to city (see Table 17) so that the ASVAB test takers were probably not representative of the population of eligibles as a whole.

Apparently there is some basis for these concerns. A regression equation was estimated relating the fraction of the eligible population in mental groups I-III upper to local economic variables where mental group distributions was evaluated as described above (see Table 18). This estimate revealed a significant relationship between local unemployment rate and the high ability fraction in the eligible population. The interpretation of this result is fairly clear. Apparently there is a tendency for more individuals in higher mental groups to take the ASVAB test when economic conditions are poor. Thus, when ASVAB scores are used to estimate the mental group composition of the eligible population a bias may be introduced which depends on local economic conditions.

The impact of the above finding on recruiting management would occur in the goal setting process. To the extent that estimates of mental group distribution in the eligible population

TABLE 17

TOTAL ELIGIBLE POPULATION AND HIGH SCHOOL ASVAB TEST TAKERS
(COMBINED SCHOOL YEARS 1976 AND 1977)

SMSA	Eligible Population	ASVAB test takers 100 eligibles
Boston	336000	2.26
New Bedford	42000	.99
Daytona	18000	2.47
Melbourne	23000	2.02
Orlando	58000	1.59
Battle Creek	18000	1.03
Jackson, Mich	14000	1.56
Kalamozoo	29000	.73
Lansing	53000	.82
Chicago	650000	.93
Gary	66000	.65
Austin	49000	1.75
Killeen	21000	2.85
San Antonio	109000	3.30
Anaheim	167000	1.17
Los Angeles	609000	1.03
Oxnard	45000	1.71
Santa Barbara	29000	.43

TABLE 13

DETERMINANTS OF LOCAL HIGH ABILITY RATIO 1/

(R^2 = .64)

VARIABLE	COEFFICIENT (F - STATISTICS)	ELASTICITY
CONSTANT	+.4767*** (63.05)	
UNEMPLOYMENT	+.6322*** (12.68)	.0896
EMPLOYMENT	+.2488** (5.46)	.1475
WAGE	+.0005 (0.73)	.1401
RECRUITER DENSITY	+.0453 (0.04)	.0019
MILITARY	+.4235** (3.62)	.0047
NON-WHITE	-.2014** (6.57)	-.0169
REGION 3	-.0777*** (46.14)	
REGION 4	-.0411*** (14.93)	
REGION 5	+.0041 (0.09)	
REGION 7	-.0703*** (36.72)	
REGION 8	.0026 (0.50)	

1/ FRACTION OF THE HIGH SCHOOL ASVAB TEST TAKERS WHO SCORED IN MENTAL GROUPS I, II, AND III UPPER DIVIDED BY THE FRACTION SCORING IN I THROUGH IV UPPER. MEAN =.66664; STANDARD DEVIATION = .0583.

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

are used to establish quality goals, managers should be aware that estimates of the number of high quality individuals available in areas with high unemployment are likely to be optimistic.

E. EVIDENCE REGARDING HYPOTHESIS 1

Hypothesis 1 asserted the existence of a relationship between local economic conditions and enlistment rates. The results of the analysis as discussed above support that hypothesis. In particular enlistment rates were influenced by local unemployment, being higher where unemployment was high. The influence appeared to be particularly strong for the higher quality segments of the eligible population indicating greater sensitivity to unemployment in those groups.

That local wages were not significantly related to enlistment rates was not suprising in view of similar results obtained in other recent studies using national and regional statistics.

Thus the dominant local economic factors affecting the recruiting result are those which measure job availability.

F. EVIDENCE CONCERNING HYPOTHESIS 2

Hypothesis 2, which asserted that training-oriented individuals react less strongly to economic conditions than job-oriented individuals, was not supported by the regression results. As stated previously, there were difficulties associated with the testing of this hypothesis which were not recognized at the outset of this study. Along with the problems in identifying training oriented individuals from the available data, there was the further problem that the less educated and

the less able Navy applicants may be turned down by a recruiter, particularly if applicants from all groups are plentiful.

Contrary to Hypothesis 2, the results of the quality ratio equations indicated that the fraction of the total enlistees who are high school graduates will increase slightly when civilian jobs are scarce. In particular, unemployment displayed a positive relationship, and employment, a negative relationship, to this ratio although elasticities were low. Results from the economic variables in the ratio of AFQT school eligible enlistees to total enlistees equation were inconclusive. Unemployment was negatively related to this ratio in one time period and positively related in the other two periods. Thus, it may be concluded that, quality of enlistees, particularly with respect to educational level, may actually increase as economic conditions deteriorate.

G. SUMMARY AND CONCLUSIONS

The discussion of the preceding sections has focused on the influence of the independent variables on the enlistment process. It will be recalled that these variables with minor changes were used in three different series of regression equations. Enlistment rate equations were estimated for cohorts of differing ability and educational levels. Then, because recruiter density appeared to be so influential in these equations, an equation for recruiter productivity was defined. Finally, because enlistment rate equations for high school graduates and AFQT school eligible

males seemed to be generally more affected by economic variables than those for non-high school graduates and non-school eligibles, equations for quality mix in the enlistee population were specified. (Quality mix was defined as the ratio of high school graduates or AFQT school eligibles to total number of recruits in an SMSA.) Results obtained with each of these equation sets were consistent and mutually supporting.

The fundamental hypothesis established for this investigation was that the enlistment decision is governed by the perceived opportunity cost associated with enlistment. This in turn is a function of local economic conditions. There is ample evidence to support this hypothesis. Local economic conditions, and local unemployment rates in particular, were clearly influential in enlistment rates for all male and non-white cohorts. Unemployment rates lagged six months had a similar impact. The influence was generally stronger for high ability/higher education groups. For these groups, more variables tended to be significant and the explanatory power of the estimates (R^2) was generally higher. This is particularly interesting since these are the groups which are most difficult to recruit and for which the Navy has a high demand.

A secondary hypothesis of the study was that enlistees may be divided into two general categories: those who are training-oriented and view the Navy as an opportunity for increasing their human capital and those who are job-oriented and view the Navy as simply an alternative to private sector employment. It was expected that these groups would react differently to economic

conditions with job-oriented individuals being more prone to enlist when the local economy was depressed and training-oriented individuals tending to be more strongly represented when the local economy was good. There was no persuasive evidence to support this hypothesis. In fact what evidence could be deduced tended to be contradictory. The ratio of high school graduate enlistees to total enlistees improved when unemployment was high. Enlistment rates for higher ability and higher education cohorts tended to be more heavily influenced by local economic conditions, rising as the economy worsened. The possiblity that goaling constraints on lower quality enlistees may be influencing these results is recognized and was discussed previously. If such constraints are operating it may not be possible to observe the hypothesized effect since identifiably job-oriented individuals may be at the constraint regardless of economic conditions.

Beyond the general findings regarding the study hypotheses the following specific conclusions can be drawn from the foregoing analysis.

- Local unemployment rate was generally significant and influential in determining enlistment behavior. High unemployment resulted in improved enlistment rates for all cohorts examined.
- Recruiter density was significant and influential in determining enlistment rates; the higher the ratio of recruiters to eligibles the higher the enlistment rate.
- Recruiter productivity was strongly influenced by local unemployment rate and the fraction non-white in the eligible population. Low unemployment or a high non-white fraction lowered productivity.

- Wage related variables were generally not significant as determinants of enlistment behavior.
- The presence of a high non-white fraction in the eligible population depressed enlistment rates and recruiter productivity. This result was significant for males, non-whites and females.
- Overall the average non-white enlistment rates were only slightly below rates for whites indicating that minority enlistment rates in areas with low minority populations were well above the average.
- Regional dummy variables revealed a significantly higher propensity to enlist in the Navy in the South and Southwest.

A number of these conclusions have important implications for recruiting managers. Some also suggest areas for further study. These topics are addressed in the next section of this report.

IV. RECOMMENDATIONS

A. POLICY/MANAGEMENT IMPLICATIONS

The preceding discussion has been primarily concerned with the influence of various economic and demographic variables on enlistment behavior. While an understanding of the way in which the variables considered affect recruiting is undeniably useful, in a general way, to those responsible for managing the Navy's recruiting effort, there remains the question of how this information can be exploited to improve recruiting performance. The identification of practical management actions which can be taken in this respect is the objective of this section.

Of the variables considered in this investigation, recruiting force strength is the only one over which ther Navy can exercise any significant degree of control. Therefore, the policy implications discussed below are concerned with ways in which the foregoing analysis suggests that deployment of recruiters can be managed to improve recruiting performance.

1. Addition of Recruiters

From the enlistment rate equations and the quality ratio equations it appears that if recruiters are added to the recruiting force, enlistment rates will increase and, further, that quality can be maintained or increased depending on goaling policy. The influence of recruiting force strength on enlistment rate was strong for all cohorts and for all time periods.

Another possible alternative for improving recruiting response is to increase the military entry level wage relative to [illegible] available in the civilian sector of the economy. This [illegible] was unable to establish any significant relationship

between local wages and enlistment behavior. Previous studies (Prior to 1972) 34/ have shown a relationship for the armed services but the strength of the relationship was generally weakest for the Navy and such that resources invested in military wages for the sole purpose of improving enlistments would far outweigh those required to achieve comparable improvements through increases in recruiting resources 35/. Thus it may be that the most effective response which the Navy can make to the anticipated recruiting difficulties of the 1980's will be to increase the recruiter to eligible ratio sufficiently to maintain required recruiting levels.

The foregoing comments should be interpreted with some caution. While the addition of recruiters will increase enlistment rates, it should be recognized that the elasticities associated with recruiter density are relatively small, implying that, on the average, each additional recruiter would only have added six to eight new recruits per year. Additionally, the decline in the eligible population, which by 1985 will have reduced the pool of Navy eligibles by approximately a third, will certainly have an impact on recruiter productivity. It therefore seems unlikely that present recruiting levels could be sustained by simply adding recruiters to the present recruiting force.

34/ See, for example, Bennett, Haber & Kinn, The Supply of Volunteers to the Armed Forces Revisited.

35/ The elasticities associated with a relative wage variable are obviously a function of the existing value of the ratio. The 1975/76 data used in this study reflect a much larger military/civilian pay ratio than exists today. Military pay raises have been capped at 5.5% per year while civilian sector wages have risen at a rate of approximately ten percent. At some point it must be expected that relative wages will become significant. Indeed they may have already become significant.

2. Deployment of Recruiters

A more significant management alternative becomes apparent when one considers the relationships between recruiter deployment and unemployment. Recruiter productivity was highly variable across SMSAs (Mean ∿12; Standard Deviation ∿10) and was generally higher in areas of high unemployment. Further, the recruiter density was not correlated with local unemployment rate. It would therefore appear that a strategy of redeploying recruiters from areas of low unemployment to those with high unemployment would tend to improve overall recruiting performance for a given total number of recruiters.

A strategy such as suggested above presents some problems in implementation. Recruiters cannot be quickly moved except in extraordinary circumstances. Local unemployment statistics are known only after some delay. These two factors suggest a delay of some months between the occurrences of high unemployment and the appropriate redeployment of recruiters. However, a lagged unemployment variable (6 months) was shown to be almost as significant as current unemployment in the recruiting rate equations so that current unemployment would serve to indicate where recruiters should be placed six months hence. Furthermore, the dynamics of the problem are such that a simple annual redeployment of recruiters is probably the maximum that is feasible. Such a redeployment could be accomplished incident to the normal rotation moves of recruiters by selectively moving billets to new locations as the incumbents leave for a new assignment. This has the obvious advantage of minimizing turbulence and Permanent Change of Station (PCS) move costs within the recruiting force.

The actual mechanism by which the Navy achieves a recruiter redeployment can take many forms; however, it should be evident that the normal nine to twelve month process by which billet changes are achieved will not suffice. The best procedure would be to make an annual plan for achieving the desired redeployment during a period of four to six months in the future. The best time for creating such a plan would appear to be in the early spring. This would allow planners to take advantage of the higher summer rotation rates in achieving the redeployment.

3. Minority Recruiting

There is strong evidence which suggests that the Navy has difficulty in recruiting high quality minority group members. The presence of a high non-white fraction in the population depresses enlistment rates and recruiter productivity tends to be lower. On the other hand, overall non-white enlistment rates are comparable to those for whites. Clearly, the Navy was expending considerable effort to recruit non-whites and was meeting with some success.

There is a potential for improving overall recruiting performance in the strategy which moves recruiters from areas with a high non-white fraction in the eligible population to areas with a low non-white fraction and high unemployment. However, this strategy would lower non-white enlistment rates and, in the long term, make the Navy population less representative of the ethnic composition of the U.S. population as a whole. For this reason, the treatment of SMSAs with significant

non-white populations will have to be carefully considered if an appropriate balance between overall and minority recruiting goals is to be maintained.

B. SUGGESTIONS FOR FURTHER STUDY

The study of the influence of local economic conditions on Navy enlistments has resulted in the identification of a number of questions which suggest further lines of investigation. It is felt that the most promising of these are as follows:

- Why do SMSAs with large minority populations differ in recruiting response?
- Are the observed results consistent over later time periods?
- Are there analytic techniques, other than regression modeling which would be more useful to recruiting by managers? Methodological approaches which respond to each of these questions are outlined below:

1. Minority Recruiting

It seems clear that a more intensive examination of recruiting in areas with high concentrations of minority group members is called for. While the present study identifies an unusual response to recruiting in such areas, limitations in the data prevent differentiation among minority groups and examination of potential causal factors. The effort should be extended to permit such analysis. The basic method should remain the same (cross sectional multiple regression) and independent variables which were significant in the present effort should be retained. However, specific minority groups should be identified, the ethnic composition of the local recruiting force should be considered and, to the extent feasible, economic variables specific

to the minority group in question should be employed. To provide some basis for comparison with the results here reported, the basic time frame for data should be retained; however the necessity for using only selected SMSAs with high non-white fractions may necessitate extension of data base to include later time periods if statistically valid results are to be obtained.

2. Extension of Results in Time

The eighteen month period in 1975/76 from which data was drawn is a fairly narrow slice of time in the past. It would obviously be beneficial to confirm the stability over time of the major effects observed by extending the analysis to later time periods. In fact, there are more specific reasons for undertaking such an extended analysis which are far more persuasive. These have to do with the findings regarding wage variables on the one hand and those relating to minority recruiting on the other.

Although wage variables were found not to be of significant influence in determining enlistment behavior, it was pointed out in the preceding discussion that the continued divergence of military and civilian wages in the interval 1976-1980 could well have caused relative wage considerations to become significant in the meantime. Clearly, if military compensation is restrained long enough with respect to wages in the civilian sector, some detrimental effect on enlistments will eventually occur. It would appear that the relatively steady increase in the gap between military and civilian wages which occurred in the period 1976-1980 presents an ideal opportunity to examine the impact of the phenomenon in the All-Volunteer Force (AVF) environment.

During discussion of the influence of the non-white fraction in the SMSA on recruiting performance, the possibility was raised that the observed results were caused by perceptions of the Navy among minority groups which grew out of the shipboard disturbances which occurred in the 1973 - 1974 time frame. Those incidents received broad media coverage and undoubtedly created an unfavorable perception of the Navy's performance with respect to equal opportunity among minority group members. To the extent that this influenced recruiting performance one would expect that the intensity of the effect would diminish as the unfavorable publicity receded into the past and the positive results of the Navy wide equal opportunity education program became apparent.

If it is decided that the study time frame should be extended as recommended the appropriate period for analysis would be the calendar years 1977 and 1978. This would provide a total of seven consecutive half year periods for analysis, providing the opportunity for the analysis of trends, and extend results to the current time frame.

3. Alternative Analytic Techniques

The usual analytic technique employed in econometric studies of recruiting or enlistment behavior has been some form of regression analysis. The large number of variables involved and the ready availability of historical data make regression techniques and attractive way to gain insights into the economic, social, and demographic factors influencing the process. However, the complexity of the process and the characteristics of the data which make regression so attractive for historical analysis create severe difficulties if the goal is to use the results for prediction at a local level.

The precise relationship which existed among influencing variables in the past is unlikely to be repeated in the future, in spite of the fact that most of the phenomena are cyclic in nature. More importantly, the regression equations generally relate enlistment behavior to then current values of independent variables. Most of these are unknown until some time after the fact because of delays incident to collecting and processing the data. Needless to say, using such equations for prediction imposes severe problems since a fundamental prerequisite becomes the necessity for predicting future values for the driving independent variables. As was suggested in connection with local unemployment data, the use of certain lagged variables may provide useful results. However, there are formidable problems attending the development of any comprehensive set of such variables which are mutually consistent and well behaved with respect to their unlagged counterparts. In view of these considerations it would appear that some alternative methodological approach to the analysis enlistment behavior which would provide management with a predictive capability is desirable. It is suggested that a methodology which would meet most of the criteria implied above is micro simulation. Micro simulation 36/ is a tool which has been found especially attractive in the modeling of labor markets because it allows the job search process of the individual to be considered in great detail. A large

---

36/ Orcutt, G., Policy Exploration Through Microanalytic Simulation. The Urban Institute: 1976; and Bergmann, B. "Empirical Work on Labor Markets: Is There Any Alternative to Regression Running?" IRRA Proceedings: 1974.

number of hypothetical individuals are endowed with various parameters relevant to the search process and then subjected to hypothesized market conditions. The aggregated results are then compared to actual observations in order to test hypotheses and/or calibrate parameters whose existence is theoretically known, but whose actual values require empirical determination.

To our knowledge, this technique has not yet been employed in the study of the determinants of enlistments, but it seems a natural one when individual decisions in the face of alternatives are the object interest.

BIBLIOGRAPHY

Altman, Stuart H. and Fechter, Alan E. "Military Manpower Procurement: The Supply of Military Personnel in the Absence of a Draft". American Economic Review, Volume LVII (May 1967) pp. 19-31.

Arima, James K. Advertising Budgets, Advertising Effectiveness, and the Navy's Recruiting Advertising Program (NPS54-78-009). Monterey, California: Naval Postgraduate School, December 1978.

Arima, James K. Determinants and a Measure of Navy Recruiter Effectiveness (NPRDC TR 78-21). Monterey, California: Naval Postgraduate School, June 1978.

Arima, James K. Educational and Training Opportunities as Incentives for Military Service (NPS 54-78-3). Monterey, California: Naval Postgraduate School, February 1978.

Arima, James K. A Systems Analysis of Navy Recruiting (Special Report 76-9). Monterey, California: Naval Postgraduate School, April 1976.

_____. Attitudes of Youth Toward Military Service: Results of a National Survey Conducted in May 1971. Alexandria, Virginia: Human Resources Research Organization, October 1971.

Becker, Gary. "The Theory of the Allocation of Time," The Economic Journal, September 1975.

Bennett, James T., Haber, Sheldon E. and Kinn, Peter J. The Supply of Volunteers to the Armed Forces Revisited (T-260). Washington, D.C.: The George Washington University, Institute for Management Science and Engineering, March 1972.

Bergmann, Barbara R. "Empirical Work on Labor Market: Is There Any Alternative to Regression Running?" (Paper) IRRA Proceedings, December 1974.

Cook, A.A. Jr. The Supply of Air Force Volunteers (RM-6361-PR). Santa Monica, California: Rand, September 1970.

Doeringer and Piori. Internal Labor Markets and Manpower Analysis. Lexington, Mass.: D.C. Heath Co., 1971.

Donelan, John O. Investigation of Goaling Models for Navy Recruiting. Monterey, California: Naval Postgraduate School, March 1977.

Fechter, Alan E. Army Enlistments and the All-Volunteer Force: The Application of an Econometric Model, Arlington, Virginia: Institute for Defense Analysis, February 1972.

Feldstein. "The Economics of the New Unemployment." The Public Interest, Fall 1973.

Fisher, Anthony C. "The Cost of the Draft and the Cost of Ending the Draft." American Economic Review, Volume LIX (1969), pp. 239-255.

Foti, Stephan G. The Importance of Socio-Economic Factors In Recruiting and Sustaining the All-Volunteer Force. Monterey, California: Naval Postgraduate School, March 1978.

Goldfarb. "Using Explanations for Unemployment to Disaggregate the Unemployment Rate," Washington, D.C.: National Commission on Employment and Unemployment Statistics, November 1970.

Grissmer, David W. and Kim, Kqan. DoD and Navy Manpower Supply: Scenarios through 2001. Bethesda, Maryland: MATHTECH, Inc., November 1976.

Hall. "Rigidity of Wages and the Persistance of Unemployment," Brookings Papers on Economic Analysis, V.2. Washington, D.C.: 1975.

Hause, John C. and Fisher, Anthony C. The Supply of First Term Enlisted Manpower in the Absence of a Draft. Arlington, Virginia: Institute for Defense Analysis, April 1968.

Marston. "Employment Instability and High Unemployment Rates," Brookings Paperson Economic Analysis, Washington, D.C.: 1. 1976.

Morey, Richard C. Budget Allocation and Enlistment Prediction: Models for the Navy's Recruiting Command. Durham, North Carolina: Duke University Center for Applied Business Research, May 1979.

Mortensen "Job Search, the Duration of Unemployment, and Optimal Job Search." Journal of Political Economics, April 1975.

Orcutt, Guy S. Caldwell and Wertheimer, R. Policy Exploration Through Microanalytic Simulation. Washington, D.C.: The Urban Institute, 1976.

Parsons, "Models for Labor Market Turnover: An Empirical Survey," Research in Labor Economics (First Annual Compilation). Edited by Erhanberg. JAI Press.

Perry, "Unemployment Flows in the U.S. Labor Market." Brookings Papers on Economic Analysis. V.2 Washington, D.C. 1972.

APPENDIX A

Tabulation of Results

Appendix A contains relevant statistics for regression runs made during the course of this study. For ease of reference tables have been organized into nine sections as follows:

Section	Content
A1.	Variable Means and Standard Deviations
A2.	Correlation coefficients between Enlistment Rate equation variables
A3.	Male AFQT School Eligible Enlistment Rate Equations
A4.	Male AFQT Non-School Eligible Enlistment Rate Equations
A5.	Male High School Graduate Enlistment Rate Equations
A6.	Male Non-High School Graduate Enlistment Rate Equations
A7.	Non-white and Female Enlistment Rate Equations
A8.	Recruiter Productivity Equations
A9.	Quality Ratio Equations

Within Sections A3-A9 tables have been organized to present regression equations first, followed by elasticities, and any special runs made on the cohort in question.

SECTION A-1

VARIABLE MEANS AND STANDARD DEVIATIONS

TABLE
A1-1

MEANS (STANDARD DEVIATIONS)
OF DEPENDENT VARIABLES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Enlistment Rate (Male AFQT School Elig.)	4.66 (1.53)	4.56 (1.33)	4.52 (1.52)
Enlistment Rate (Male IIIL and IVu)	3.88 (1.68)	4.58 (1.75)	5.15 (1.85)
Enlistment Rate (Male H.S. Graduate)	4.12 (1.45)	4.02 (1.33)	4.28 (1.42)
Enlistment Rate (Male Non H.S. Graduate)	3.74 (2.48)	4.66 (2.49)	4.54 (2.44)
Recruiter Productivity (AFQT School Eligible)	11.90 (8.02)	10.97 (8.70)	11.07 (9.16)
Recruiter Productivity (H.S. Graduate)	12.85 (8.37)	12.04 (10.55)	12.53 (10.45)
Ratio (School Elig. To Total)	.706 (.072)	.671 (.075)	.637 (.084)
Ratio (Graduate To Total)	.765 (.085)	.695 (.101)	.714 (.082)

NOTE: Enlistment rates are per 1000 eligibles. Refer to section II for data sources and computations of variables.

AD-A083 945 INFORMATION SPECTRUM INC ARLINGTON VA F/G 5/9
THE EFFECTS OF LOCAL ECONOMIC CONDITIONS ON NAVY ENLISTMENTS.(U)
MAR 80 M COWIN, F E O'CONNOR, L C SAGE N00014-78-C-0492
UNCLASSIFIED ISI-V-8086-07 NL

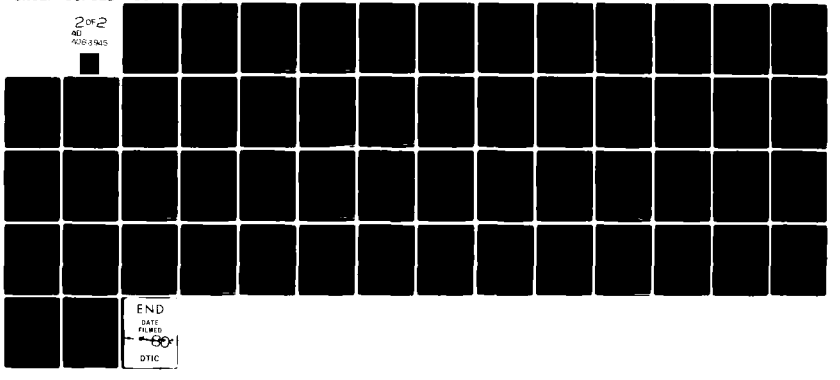


TABLE
A1-2

MEANS (STANDARD DEVIATIONS)
OF ECONOMIC VARIABLES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
UNEMPLOYMENT	.0808 (.0198)	.0802 (.0199)	.0746 (.0211)
LAGGED UNEMPLOYMENT	.0840 (.0240)	.0808 (.0198)	.0802 (.0199)
EMPLOYMENT	.4056 (.0396)	.4023 (.0395)	.4136 (.0416)
ΔUNEMPLOYMENT	-.0401 (.1206)	-.0235 (.1018)	-.0756 (.1173)
ΔEMPLOYMENT	.0235 (.0189)	.0050 (.0193)	.0280 (.0159)
ΔWAGE	.0626 (.0273)	.0364 (.0349)	.0435 (.0187)
EXPECTED WAGE	186.90 (29.38)	194.60 (32.39)	204.93 (34.68)

TABLE
A1-3

MEANS (STANDARD DEVIATIONS)
OF OTHER INDEPENDENT VARIABLES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
RECRUITER DENSITY	.000276 (.000155)	.000310 (.000171)	.000303 (.000175)
MILITARY	.0076 (.0185)	.0074 (.0181)	.0074 (.0181)
NON-WHITE (SE)[1/]	.0548 (.0435)	.0569 (.0443)	.0569 (.0443)
NON WHITE (NSE) [2/]	.1961 (.1350)	.1968 (.1359)	.1968 (.1359)
NON-WHITE (TOT)	.1413 (.1053)	.1396 (.1074)	.1396 (.1074)
HIGHQ (GR)[3/]	.7167 (.0967)	.7057 (.0948)	.7057 (.0948)
HIGHQ (SE) [4/]	.6666 (.0577)	.6666 (.0577)	.6666 (.0577)

1/ FRACTION OF THE AFQT SCHOOL ELIGIBLE POPULATION WHO ARE NON-WHITE

2/ FRACTION OF THE ELIGIBLE POPULATION IN AFQT MENTAL GROUPS III LOWER AND IV UPPER WHO ARE NON-WHITE

3/ FRACTION OF THE ELIGIBLE POPULATION WHO ARE HIGH SCHOOL GRADUATES

4/ FRACTION OF THE ELIGIBLE POPULATION WHO ARE IN AFQT MENTAL GROUPS I THROUGH III UPPER.

SECTION A-2

CORRELATION MATRICES

TABLE A2-1

CORRELATIONS BETWEEN MALE ENLISTMENT RATES
AND INDEPENDENT VARIABLES
1975/2

	School Eligible	IIIl & IVu	High School Graduate	Non High School Graduate
Unemployment	.078	.139	.213	-.033
Employment	-.113	-.024	-.178	.067
ΔUnemployment	.156	.042	.161	.004
ΔEmployment	.076	.009	.094	-.106
ΔWage	.059	.041	.027	-.025
Recruiter Density	.343	.311	.320	.181
Military	.076	.081	.191	.187
Non-White	.225	-.145	-.189	-.282
Region 3	-.046	-.390	-.159	-.283
Region 4	-.078	-.068	-.155	.151
Region 5	-.193	-.087	-.249	.089
Region 7	.314	.123	.176	.074
Region 8	.163	.277	.425	-.109

TABLE A2-2

CORRELATIONS BETWEEN INDEPENDENT VARIABLES
1975/2

	Unemp.	Emp.	ΔUnemp	ΔEmp	ΔWage	Non-White	Recruiter Density	Military
Employment	-.499							
ΔUnemployment	.073	-.141						
ΔEmployment	-.263	.177	-.494					
ΔWage	-.090	.052	-.215	.151				
Non-White	-.028	.034	.118	-.003	.013			
Recruiter Density	-.099	.001	.216	-.029	.072	-.009		
Military	-.007	-.348	.052	.269	-.011	.193	.011	
Region 3	-.034	.019	-.058	.095	.072	.190	-.094	-.011
Region 4	-.063	-.005	-.279	.045	.105	-.041	-.134	-.110
Region 5	-.281	.257	.155	-.120	-.019	-.044	.007	-.121
Region 7	-.219	.017	.180	.200	.185	.050	.274	.156
Region 8	.239	-.087	.086	.080	-.127	.124	.113	.311

TABLE A2-3

CORRELATIONS BETWEEN MALE ENLISTMENT RATES
AND INDEPENDENT VARIABLES
1976/1

	School Eligible	IIIl and IVu	High School Graduates	Non High School Graduates
Unemployment	.114	.324	.377	-.031
Employment	-.192	-.075	-.302	.107
ΔUnemployment	-.076	.234	.144	-.053
ΔEmployment	-.033	-.121	-.016	-.126
ΔWage	-.063	-.033	-.107	.065
Recruiter Density	.341	.149	.233	.151
Military	.046	.034	.205	-.156
Non-white	-.276	-.103	-.158	-.288
Region 3	.062	-.312	-.008	-.340
Region 4	-.161	-.090	-.202	.089
Region 5	-.084	.043	-.224	.363
Region 7	.184	-.006	-.054	.143
Region 8	.052	.239	.279	-.074

TABLE A2-4

CORRELATIONS BETWEEN INDEPENDENT VARIABLES

1976/1

	Unemp.	Employ	ΔUnemp.	ΔEmploy	ΔWage	Non-White	Recruiter Density	Military
Employment	-.496							
ΔUnemployment	.202	-.113						
ΔEmployment	-.023	-.007	-.583					
ΔWage	.017	-.095	-.167	.082				
Non-white	-.041	.018	.033	-.022	-.040			
Recruiter Density	-.103	-.016	-.030	.033	-.049	-.007		
Military	.022	-.362	.093	.001	-.033	.204	.010	
Region 3	-.188	.003	-.317	.054	.013	.210	-.025	-.038
Region 4	-.133	.070	-.088	.048	.231	-.046	-.108	-.113
Region 5	-.272	.252	-.020	-.057	.149	-.040	.031	-.096
Region 7	-.245	.010	-.033	.041	-.106	.045	.254	.160
Region 8	.258	-.100	-.008	.256	-.118	.110	.056	.305

TABLE A2-5

CORRELATIONS BETWEEN MALE ENLISTMENT RATES
AND INDEPENDENT VARIABLES
1976/2

	School Eligible	IIIl & IVu	High School Graduate	Non High School Graduate
Unemployment	-.004	.183	.143	-.054
Employment	-.105	-.165	-.244	.074
ΔUnemployment	.156	.231	.305	-.139
ΔEmployment	.009	-.018	-.066	.146
ΔWage	.046	-.053	.062	-.019
Recruiter Density	.293	.237	.233	.230
Military	.073	.044	.135	.004
Non-White	-.090	.041	.210	-.358
Region 3	.289	-.063	.369	-.339
Region 4	-.082	-.048	-.115	.103
Region 5	.022	.016	-.079	.228
Region 7	.265	.195	.113	.289
Region 8	-.090	.044	-.012	-.054

TABLE A2-6

CORRELATIONS BETWEEN INDEPENDENT VARIABLES
1976/2

	Unemp	Emp	ΔUnemp	ΔEmp	ΔWage	Non-White	Recruiter Density	Military
Employment	-.520							
ΔUnemployment	.465	-.234						
ΔEmployment	-.203	.235	-.226					
ΔWage	-.025	.173	-.189	.020				
Non-White	.085	-.010	.285	-.188	-.049			
Recruiter Density	-.076	.002	.048	.038	.086	-.007		
Military	.106	-.342	.215	.086	-.114	.204	.019	
Region 3	-.104	-.035	.184	-.252	.092	.210	-.023	-.038
Region 4	-.229	.086	-.247	.115	-.003	-.046	-.090	-.113
Region 5	-.318	.229	-.312	-.094	-.005	-.040	.027	-.096
Region 7	-.169	.038	.121	.186	-.163	.045	.235	.160
Region 8	.297	-.075	.176	.135	-.011	.110	.039	.305

SECTION A-3

ENLISTMENT RATE
AFQT SCHOOL ELIGIBLE MALES

TABLE A3-1
ENLISTMENT RATE
AFQT SCHOOL ELIGIBLE MALES
COEFFIECIENTS (F-STATISTICS)

	TIME PERIOD		
	1975/2	1976/1	1976/2
CONSTANT	+2.58 (1.57)	+4.48** (5.76)	+2.50 (1.64)
UNEMPLOYMENT	+14.96* (3.55)	+12.44* (2.72)	+18.68** (4.77)
EMPLOYMENT	-.16 (0.00)	-3.60 (1.06)	-2.63 (0.51)
ΔUNEMPLOYMENT	+1.97 (2.30)	-1.54 (1.15)	+1.38 (1.16)
ΔEMPLOYMENT	+4.24 (0.25)	-12.84* (3.29)	+6.81 (0.69)
ΔWAGE	+3.92 (0.72)	-.49 (0.02)	+6.91 (1.15)
RECRUITER DENSITY	+2110.00*** (6.69)	+2227.00*** (12.11)	+1783.00*** (6.98)
MILITARY	-2.51 (0.10)	+.25 (0.00)	+1.29 (0.03)
NON-WHITE	-10.53*** (13.07)	-10.32*** (15.97)	-9.30*** (19.71)
REGION 3	+.95** (5.14)	+.90** (4.29)	+2.51*** (36.17)
REGION 4	+.67* (3.17)	+.19 (0.27)	+1.33*** (12.37)
REGION 5	-.17 (0.12)	+.28 (0.28)	+2.10*** (13.92)
REGION 7	+1.74*** (11.95)	+1.08** (5.55)	+2.34*** (24.57)
REGION 8	+1.09** (6.49)	+.64 (2.60)	+.71* (3.31)
R^2	.34	.31	.39

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A3-2
ENLISTMENT RATE
MALE AFQT SCHOOL ELIGIBLE

ELASTICITIES

	1975/2	1976/1	1976/2
Unemployment	.2594	.2188	.3083
Employment	-.0140	-.3170	-.2404
ΔUnemployment	-.0170	.0079	-.0230
ΔEmployment	.0214	-.0141	.0422
ΔWage	.0527	-.0039	.0666
Recruiter Density	.1249	.1511	.1196
Military	-.0041	.0004	.0021
Non-White	-.1239	-.1286	-.1170

TABLE A3-3

STEPWISE MULTIPLE REGRESSION
OF MALE AFQT SCHOOL ELIGIBLE ENLISTMENT RATES
1975/2

VARIABLE	COEFFICIENT	F AT ENTRY	TERMINAL F	R2	OVERALL F	SIGNIFICANCE
RECRUITER DENSITY	+2110.00	14.69	6.69	.105	14.69	.000
NON-WHITE	- 10.53	6.18	13.07	.147	10.74	.000
UNEMPLOYMENT	+ 14.97	4.25	3.55	.176	8.76	.000
ΔEMPLOYMENT	+ 4.24	1.86	.25	.182	7.08	.000
ΔUNEMPLOYMENT	+ 1.97	5.19	2.30	.221	6.90	.000
ΔWAGE	+ 3.92	1.44	.72	.231	6.01	.000
MILITARY	- 2.51	.19	.10	.232	5.14	.000
EMPLOYMENT	- .16	.06	.00	.232	4.47	.000
REGION 7	+ 1.73	6.82	11.95	.274	4.93	.000
REGION 5	- .17	3.31	.12	.295	4.86	.000
REGION 8	+ 1.09	2.45	6.49	.309	4.69	.000
REGION 3	+ .95	2.45	5.14	.324	4.56	.000
REGION 4	+ .67	3.17	3.17	.342	4.53	.000

NOTE: THE PROCEDURE USED WAS FORWARD STEPWISE INCLUSION WITH THE PREESTABLISHED HIERARCHY THAT REGION DUMMY VARIABLES WOULD NOT BE INCLUDED UNTIL THE ECONOMIC AND DEMOGRAPHIC VARIABLES HAD BEEN TESTED. ALL VARIABLES WITH AN F RATIO $\geq$ .01 WERE ENTERED INTO THE EQUATION.

TABLE A3-4
STEPWISE MULTIPLE REGRESSION
OF AFQT SCHOOL ELIGIBLE ENLISTMENT RATES
1976/1

VARIABLES	COEFFICIENT	F AT ENTRY	TERMINAL F	R^2	OVERALL F	SIGNIFICANCE
RECRUITER DENSITY	+2227.00	16.40	12.11	.116	16.40	.000
NON-WHITE	- 10.32	11.26	15.07	.190	14.51	.000
EMPLOYMENT	- 3.60	5.24	1.06	.223	11.75	.000
ΔUNEMPLOYMENT	- 1.52	.97	1.15	.229	9.05	.000
ΔEMPLOYMENT	- 12.84	2.29	3.29	.243	7.78	.000
UNEMPLOYMENT	+ 12.44	1.02	2.72	.250	6.65	.000
MILITARY	+ .25	.61	.00	.253	5.77	.000
ΔWAGE	- .49	.48	.02	.256	5.09	.000
REGION 7	+ 1.08	2.79	5.55	.274	4.30	.000
REGION 3	+ .90	3.55	4.29	.295	4.26	.000
REGION 8	+ .64	2.40	2.60	.310	4.69	.000
REGION 5	+ .28	.10	.28	.310	4.28	.000
REGION 4	+ .19	.27	.27	.312	3.94	.000

NOTE: THE PROCEDURE USED WAS FORWARD STEPWISE INCLUSION WITH THE PREESTABLISHED HIERARCHY THAT REGION DUMMY VARIABLES WOULD NOT BE INCLUDED UNTIL THE ECONOMIC AND DEMOGRAPHIC VARIABLES HAD BEEN TESTED. ALL VARIABLES WITH AN F RATIO $\geq .01$ WERE ENTERED INTO THE EQUATION.

TABLE A3-5

STEPWISE MULTIPLE REGRESSION
OF MALE AFQT SCHOOL ELIGIBLE ENLISTMENT RATES
1976/2

VARIABLE	COEFFICIENT	F AT ENTRY	TERMINAL F	R^2	OVERALL F	SIGNIFICANCE
RECRUITER DENSITY	+1783.00	11.70	6.98	.086	11.70	.001
ΔUNEMPLOYMENT	+1.38	2.78	1.16	.106	7.33	.001
NON-WHITE	-9.30	2.52	10.71	.124	5.78	.001
UNEMPLOYMENT	+18.68	1.60	4.77	.135	4.48	.002
EMPLOYMENT	-2.63	.61	.51	.139	3.92	.003
ΔWAGE	+6.91	.87	1.15	.146	3.41	.004
ΔEMPLOYMENT	+6.81	.12	.69	.146	2.92	.008
MILITARY	+1.29	.04	.03	.147	2.54	.014
REGION 3	+2.51	12.71	36.17	.230	3.39	.000
REGION 7	+2.34	10.61	24.57	.294	4.35	.000
REGION 5	+2.10	5.01	13.92	.324	5.02	.000
REGION 4	+1.33	8.97	12.37	.374	5.66	.000
REGION 8	+.71	3.31	3.31	.391	5.59	.000

NOTE: THE PROCEDURE USED WAS FORWARD STEPWISE INCLUSION WITH THE PREESTABLISHED HIERARCHY THAT REGION DUMMY VARIABLES WOULD NOT BE INCLUDED UNTIL THE ECONOMIC AND DEMOGRAPHIC VARIABLES HAD BEEN TESTED. ALL VARIABLES WITH AN F RATIO $\geq$ .01 WERE ENTERED INTO THE EQUATION.

TABLE A3-6

ENLISTMENT RATE
MALE AFQT SCHOOL ELIGIBLE
LAGGED UNEMPLOYMENT
COEFFICIENTS (F-STATISTICS)

	TIME PERIOD		
	1975/2	1976/1	1976/2
CONSTANT	+2.87 (2.06)	+4.63** (6.05)	+1.98 (1.02)
LAGGED UNEMPLOYMENT	+12.96* (3.15)	+11.30 (2.32)	+20.68** (6.18)
EMPLOYMENT	-.41 (0.01)	-3.69 (1.10)	-1.64 (0.19)
ΔUNEMPLOYMENT	+2.98** (4.35)	-.69 (0.20)	+2.57** (4.84)
ΔEMPLOYMENT	+3.51 (0.17)	-13.18* (3.44)	+5.48 (0.45)
ΔWAGE	+3.83 (0.68)	-.48 (0.02)	+6.03 (0.87)
RECRUITER DENSITY	+2122.00*** (6.73)	+2248.00*** (12.26)	+1783.00*** (6.52)
MILITARY	-2.31 (0.08)	+.22 (0.00)	+2.55 (0.11)
NON-WHITE	-10.61*** (13.21)	-10.27*** (15.77)	-9.38*** (10.90)
REGION 3	+.95** (5.10)	+.87** (4.04)	+2.55*** (37.66)
REGION 4	+.64* (2.96)	+.17 (0.20)	+1.37*** (13.18)
REGION 5	-.21 (0.20)	+.24 (0.21)	+2.19*** (14.72)
REGION 7	+1.71*** (11.59)	+1.05** (5.28)	+2.39*** (24.93)
REGION 8	+1.10** (6.59)	+.63 (2.51)	+.69* (3.88)
R^2	.34	.31	.39

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A3-7

ENLISTMENT RATES
MALE AFQT SCHOOL ELIGIBLE
EXPECTED WAGE
COEFFICIENTS (F-STATISTICS)

	TIME PERIOD		
	1975/2	1976/1	1976/2
CONSTANT	+3.35**	+5.88***	+4.64***
	(4.25)	(16.23)	(9.26)
EXPECTED WAGE	+.01**	+.00	+.01
	(4.26)	(1.16)	(1.98)
EMPLOYMENT	-2.91	-6.21**	-5.65***
	(0.72)	(4.27)	(6.68)
ΔUNEMPLOYMENT	+1.72	-1.38	+2.29*
	(1.80)	(0.92)	(3.84)
ΔEMPLOYMENT	+4.50	-12.81*	+5.61
	(0.29)	(3.25)	(0.45)
RECRUITER DENSITY	+2275.00***	+2131.00***	+1749.00***
	(8.01)	(11.06)	(6.68)
MILITARY	-1.46	-1.00	+.20
	(0.03)	(0.02)	(0.00)
NON-WHITE	-11.44**	-10.27***	-8.96***
	(4.81)	(15.88)	(9.67)
REGION 3	+.90**	+.73*	+2.23***
	(4.81)	(3.09)	(32.89)
REGION 4	+.15	-.19	+.74*
	(0.16)	(0.26)	(3.47)
REGION 5	-.69	-.21	+1.37**
	(2.01)	(0.17)	(5.91)
REGION 7	+1.52***	+.79*	+1.87***
	(9.85)	(3.47)	(17.73)
REGION 8	+.97**	+.56	+.59
	(5.28)	(2.01)	(2.15)
R^2	.35	.30	.37

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

SECTION A-4

ENLISTMENT RATES
AFQT NOT SCHOOL MALES

TABLE A4-1

ENLISTMENT RATE
NOT AFQT SCHOOL ELIGIBLE MALES
COEFFICIENTS (F-STATISTICS)

	TIME PERIOD		
	1975/2	1976/1	1976/2
CONSTANT	+2.92 (1.78)	-.04 (0.00)	+5.09* (3.48)
UNEMPLOYMENT	+6.78 (0.67)	+30.17*** (8.54)	+17.92 (2.26)
EMPLOYMENT	-1.01 (0.06)	+3.97 (0.69)	-6.04 (1.40)
ΔUNEMPLOYMENT	+.14 (0.01)	+1.43 (0.52)	+3.03* (2.85)
ΔEMPLOYMENT	+10.21 (1.23)	-9.63 (0.97)	+6.53 (0.32)
ΔWAGE	+5.84 (1.43)	+.43 (0.01)	+2.33 (0.07)
RECRUITER DENSITY	+2692.00*** (9.11)	+1620.00* (3.41)	+1965.00** (4.32)
MILITARY	-19.22** (4.70)	-1.02 (0.01)	-9.77 (0.87)
NON-WHITE	+.58 (0.29)	+.16 (0.01)	-.02 (0.00)
REGION 3	-1.93*** (17.84)	-.66 (1.16)	+.37 (0.38)
REGION 4	-.69* (2.88)	+.08 (0.02)	+.85 (2.57)
REGION 5	-.81 (2.34)	+.81 (1.24)	+1.74** (4.88)
REGION 7	-.20 (0.14)	+.37 (0.35)	+1.50** (5.19)
REGION 8	+.67 (2.08)	+.84 (2.48)	+.47 (0.74)
R^2	.34	.25	.19

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A4-2

ENLISTMENT RATES
MALE NOT AFQT SCHOOL ELIGIBLES
ELASTICITIES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.1431	.5282	.2154
Employment	-.1058	.3484	-.5126
ΔUnemployment	-.0015	-.0072	-.0476
ΔEmployment	.0604	-.0105	.0323
ΔWage	.0946	.0034	.0223
Recruiter Density	.1888	.1095	.1160
Military	-.0367	-.0016	-.0140
Non-white	.0290	.0050	.0099

TABLE A4-3

STEPWISE MULTIPLE REGRESSION
OF MALE NOT AFQT SCHOOL ELIGIBLE ENLISTMENT RATES
1975/2

VARIABLE	COEFFICIENT	F AT ENTRY	TERMINAL F	R^2	OVERALL F	SIGNIFICANCE
RECRUITER DENSITY	+2692.00	13.77	9.11	.096	13.77	.000
UNEMPLOYMENT	+6.78	4.27	.67	.126	9.19	.000
NON-WHITE	+.58	2.16	.29	.140	6.90	.000
EMPLOYMENT	-1.01	.76	.06	.145	5.36	.001
ΔEMPLOYMENT	+1.02	.53	1.23	.149	4.38	.001
MILITARY	-19.22	.71	4.70	.154	3.76	.002
ΔWAGE	+5.84	.14	1.43	.155	3.23	.004
ΔUNEMPLOYMENT	+1.42	.09	.01	.155	2.80	.007
REGION 3	-1.93	20.62	17.84	.278	5.18	.000
REGION 8	+.67	5.85	2.08	.312	5.44	.000
REGION 4	-.69	1.82	2.38	.322	5.14	.000
REGION 5	-.81	2.29	2.34	.335	4.96	.000
REGION 7	-.20	.14	.14	.336	4.55	.000

NOTE: THE PROCEDURE USED WAS FORWARD STEPWISE INCLUSION WITH THE PREESTABLISHED HIERARCHY THAT REGION DUMMY VARIABLES WOULD NOT BE INCLUDED UNTIL THE ECONOMIC AND DEMOGRAPHIC VARIABLES HAD BEEN TESTED. ALL VARIABLES WITH AN F RATIO $\geq .01$ WERE ENTERED INTO THE EQUATION.

TABLE A4-4

STEPWISE MULTIPLE REGRESSION
OF MALE NOT AFQT SCHOOL ELIGIBLE ENLISTMENT RATES
1976/1

VARIABLE	COEFFICIENT	F AT ENTRY	TERMINAL F	R^2	OVERALL F	SIGNIFICANCE
UNEMPLOYMENT	+30.17	14.61	8.54	.105	14.61	.000
RECRUITER DENSITY	+1620.00	4.84	3.41	.138	9.95	.000
ΔUNEMPLOYMENT	+1.41	4.48	.52	.169	8.31	.000
EMPLOYMENT	+3.97	1.97	.69	.182	6.78	.000
MILITARY	-1.02	.55	.01	.186	5.51	.000
NON-WHITE	+.12	.60	.01	.190	4.68	.000
ΔEMPLOYMENT	-9.63	.12	.97	.190	4.00	.001
ΔWAGE	+.43	.07	.01	.191	3.48	.001
REGION 3	-.66	5.03	1.16	.224	3.76	.000
REGION 8	+.84	2.45	2.48	.240	3.67	.000
REGION 5	+.81	1.22	1.24	.248	3.45	.000
REGION 7	+.37	.38	.35	.251	3.18	.001
REGION 4	+.08	.02	.02	.251	2.91	.001

NOTE: THE PROCEDURE USED WAS FORWARD STEPWISE INCLUSION WITH THE PREESTABLISHED HIERARCHY THAT REGION DUMMY VARIABLES WOULD NOT BE INCLUDED UNTIL THE ECONOMIC AND DEMOGRAPHIC VARIABLES HAD BEEN TESTED. ALL VARIABLES WITH AN F RATIO $\geq$ .01 WERE ENTERED INTO THE EQUATION.

TABLE A4-5

STEPWISE MULTIPLE REGRESSION
OF MALE NOT AFQT SCHOOL ELIGIBLE ENLISTMENT RATES
1976/2

VARIABLE	COEFFICIENT	F AT ENTRY	TERMINAL F	R^2	OVERALL F	SIGNIFICANCE
RECRUITER DENSITY	+1965.00	7.42	4.32	.056	7.42	.007
ΔUNEMPLOYMENT	+3.03	6.73	2.85	.105	7.24	.001
EMPLOYMENT	-6.04	1.89	1.40	.118	5.50	.001
UNEMPLOYMENT	+17.92	.54	1.40	.122	4.24	.003
ΔEMPLOYMENT	+6.53	.33	.32	.124	3.44	.006
MILITARY	-9.77	.31	.87	.127	2.90	.011
ΔWAGE	+2.33	.08	.07	.127	2.48	.021
NON-WHITE	-.02	.01	.00	.127	2.15	.036
REGION 7	+1.50	2.75	5.19	.149	2.25	.023
REGION 5	+1.74	3.00	4.88	.169	2.36	.014
REGION 4	+.85	1.90	2.57	.182	2.33	.013
REGION 8	+.47	.47	.74	.186	2.16	.018
REGION 3	+.37	.38	.38	.189	2.02	.025

NOTE: THE PROCEDURE USED WAS FORWARD STEPWISE INCLUSION WITH THE PREESTABLISHED HIERARCHY THAT REGION DUMMY VARIABLES WOULD NOT BE INCLUDED UNTIL THE ECONOMIC AND DEMOGRAPHIC VARIABLES HAD BEEN TESTED. ALL VARIABLES WITH AN F RATIO $\geq .01$ WERE ENTERED INTO THE EQUATION.

TABLE A4-6
ENLISTMENT RATE
MALE NOT AFQT SCHOOL ELIGIBLE
EXPECTED WAGE
COEFFICIENTS (F-STATISTICS)

	TIME PERIOD		
	1975/2	1976/1	1976/2
CONSTANT	+8.49***	+6.92***	+8.52***
	(15.61)	(7.88)	(10.15)
EXPECTED WAGE	-.00	+.01	+.01
	(0.05)	(2.54)	(1.11)
EMPLOYMENT	-3.89	-3.45	-9.60**
	(1.14)	(0.71)	(4.69)
ΔUNEMPLOYMENT	-.04	+1.65	+4.47***
	(0.00)	(0.72)	(7.48)
ΔEMPLOYMENT	+14.95*	-11.61	+7.33
	(2.81)	(1.43)	(0.40)
RECRUITER DENSITY	+2861.00***	1454.00*	+1917.00**
	(11.43)	(2.80)	(4.23)
MILITARY	-23.75***	-6.15	-11.63
	(7.80)	(0.42)	(1.22)
NON-WHITE	+1.71	+.72	+.28
	(2.46)	(0.34)	(0.04)
LOWABLE	-11.80***	-9.77**	-4.92
	(12.00)	(6.23)	(1.21)
REGION 3	-1.10*	-.22	+.54
	(3.78)	(0.11)	(0.67)
REGION 4	-.34	-.40	+.46
	(0.60)	(0.56)	(0.62)
REGION 5	-.87*	-.23	+1.13
	(2.82)	(0.11)	(2.08)
REGION 7	+.81	+.61	+1.53**
	(1.93)	(0.80)	(4.50)
REGION 8	+.52	+.65	+.29
	(1.36)	(1.48)	(0.28)
R^2	.39	.26	.19

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

SECTION A-5

ENLISTMENT RATES
MALE HIGH SCHOOL GRADUATES

TABLE A5-1

ENLISTMENT RATE
MALE HIGH SCHOOL GRADUATES
COEFFICIENTS (F-STATISTICS)

	TIME PERIOD		
	1975/2	1976/1	1976/2
CONSTANT	+3.34*	+3.12*	+4.74**
	(3.41)	(2.70)	(6.35)
UNEMPLOYMENT	+7.57	+17.34**	+11.85
	(1.22)	(5.46)	(2.12)
EMPLOYMENT	-1.81	-1.93	-7.32**
	(0.27)	(0.32)	(4.44)
ΔUNEMPLOYMENT	+2.21*	+1.19	+2.61**
	(3.52)	(0.71)	(4.44)
ΔEMPLOYMENT	+12.10	-1.72	+10.10
	(2.56)	(0.06)	(1.68)
ΔWAGE	+5.76	-1.24	+9.51
	(2.04)	(0.15)	(2.37)
RECRUITER DENSITY	+2055.00***	+2111.00***	+1492.00**
	(7.80)	(11.18)	(5.32)
MILITARY	-.12	+10.44	-.30
	(0.00)	(2.29)	(0.00)
NON-WHITE	-2.62**	-2.38**	-.92
	(4.79)	(4.20)	(0.57)
REGION 3	-.04	+.57	+2.12***
	(0.01)	(1.54)	(24.91)
REGION 4	-.12	-.21	+.88**
	(0.14)	(0.34)	(6.06)
REGION 5	-.88**	-.63	+1.37***
	(4.02)	(1.49)	(6.54)
REGION 7	+.43	-.15	+1.23***
	(0.91)	(0.10)	(7.30)
REGION 8	+1.25	+.42	+.45
	(10.68)	(1.18)	(1.49)
R^2	.39	.33	.36

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A5-2

ENLISTMENT RATES
MALE HIGH SCHOOL GRADUATES
ELASTICITIES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.1503	.3464	.2065
Employment	-.1778	-.1928	-.7078
ΔUnemployment	-.0212	-.0069	-.0461
ΔEmployment	.0674	-.0021	.0661
ΔWage	.0879	-.0113	.0968
Recruiter Density	.1358	.1628	.1057
Military	-.0002	.0192	-.0005
Non-white	-.0871	-.0826	-.0300

SECTION A-6

ENLISTMENT RATES
MALE NON HIGH SCHOOL GRADUATES

TABLE A6-1
ENLISTMENT RATES
MALE NON-HIGH SCHOOL GRADUATES
COEFFICIENTS (F-STATISTICS)

	TIME PERIOD		
	1975/2	1976/1	1976/2
CONSTANT	+3.10 (0.76)	+3.23 (0.96)	-.24 (0.01)
UNEMPLOYMENT	+.57 (0.00)	+16.51 (1.54)	+26.37* (3.73)
EMPLOYMENT	+2.67 (0.15)	-.63 (0.01)	+4.07 (0.49)
ΔUNEMPLOYMENT	-1.20 (0.27)	-6.55*** (6.69)	-.34 (0.03)
ΔEMPLOYMENT	-10.92 (0.54)	-41.38*** (10.71)	+4.46 (0.12)
ΔWAGE	-5.13 (0.42)	-.85 (0.02)	+4.27 (0.17)
RECRUITER DENSITY	+3005.00** (4.32)	+1563.00 (1.92)	+2556.00** (5.56)
MILITARY	-12.40 (0.75)	-18.65 (2.27)	+4.74 (0.16)
NON-WHITE	-4.92** (4.39)	-4.91** (5.57)	-8.53*** (17.41)
REGION 3	-.89 (1.31)	-.75 (0.84)	+.53 (0.57)
REGION 4	+.70 (1.13)	+1.19* (3.25)	+1.83*** (9.19)
REGION 5	+.30 (0.12)	+3.88*** (17.33)	+3.36*** (13.88)
REGION 7	+.64 (0.51)	+2.06** (6.33)	+3.21*** (17.81)
REGION 8	-.70 (0.86)	+.67 (0.94)	+.28 (0.13)
R^2	.20	.38	.39

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A6-2

ENLISTMENT RATES

MALE NON HIGH SCHOOL GRADUATES

ELASTICITIES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.0124	.2843	.4328
Employment	.2893	-.0547	.3703
ΔUnemployment	.0127	.0330	.0061
ΔEmployment	-.0670	.0445	.0275
ΔWage	-.0862	-.0066	.0409
Recruiter Density	.2187	.1039	.1706
Military	-.0246	-.0296	.0077
Non-white	-.1805	-.1471	-.2621

SECTION A-7

ENLISTMENT RATES
FEMALES AND NON WHITES

TABLE A7-1
NON-WHITE AND FEMALE
ENLISTMENT RATE EQUATIONS FOR 1976

MEANS AND STANDARD DEVIATIONS OF VARIABLES

VARIABLE	MEAN	STANDARD DEVIATION
Enlistment Rate (Non-White School Eligible)	.0077	.0055
Enlistment Rate (Non-White IIIL and IV)	.0065	.0044
Enlistment Rate (Female)	.00044	.00024
Unemployment	.0804	.0196
Employment	.4080	.0404
ΔUnemployment	-.0496	.0816
ΔEmployment	.0165	.0118
Wage	199.78	33.44
Recruiter Density	.000310	.000171
Military	.0074	.0181
Non-White Eligibles (I,II,IIIU) 1/	.0569	.0443
Non-White Eligibles(IIIL, IVU)	.1968	.1357

1/ Fraction of the eligible population in AFQT mental groups I, II and III upper who are non-white. Used in AFQT school eligible equations.

TABLE A7-2
ENLISTMENT RATE
NON-WHITE AFQT SCHOOL ELIGIBLE
1976 (R^2 = .19)

VARIABLE	COEFFICIENT (F-STATISTIC)	ELASTICITY
CONSTANT	+22.79*** (6.68)	
UNEMPLOYMENT	-18.19 (0.29)	-.1899
EMPLOYMENT	-28.88** (3.61)	-1.5287
ΔUNEMPLOYMENT	-2.43 (0.12)	.0155
WAGE	-.02 (1.39)	-.5496
RECRUITER DENSITY	+6240.00** (4.82)	.2481
MILITARY	+.04 (0.00)	.0000
NON-WHITE	-24.26** (4.20)	-.1790
REGION 3	+2.44 (1.90)	
REGION 4	+1.96 (1.25)	
REGION 5	+4.37* (3.11)	
REGION 7	+3.35* (3.00)	
REGION 8	+.84 (0.26)	

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A7-3

ENLISTMENT RATE
NON-WHITE NOT AFQT SCHOOL ELIGIBLE

1976 (R^2 = .11)

VARIABLE	COEFFICIENT (F-STATISTIC)	ELASTICITY
CONSTANT	+12.29* (2.79)	
UNEMPLOYMENT	-18.86 (0.45)	-.2345
EMPLOYMENT	-10.68 (0.70)	-.6736
ΔUNEMPLOYMENT	+10.92* (3.39)	-.0837
ΔEMPLOYMENT	+44.06 (1.19)	.1125
WAGE	+.00 (0.03)	.0795
RECRUITER DENSITY	-689.94 (0.08)	-.0327
MILITARY	-9.29 (0.12)	-.0106
NON-WHITE	-17.02* (2.87)	-.1497
REGION 3	-.75 (0.25)	
REGION 4	+.66 (0.20)	
REGION 5	+2.40 (1.35)	
REGION 7	+1.06 (0.39)	
REGION 8	+1.56 (1.07)	

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A7-4

ENLISTMENT RATE
FEMALES (1976)
(R^2 = .21)

VARIABLE	COEFFICIENT (F-STATISTICS)	ELASTICITY
CONSTANT	+.16 (0.17)	
UNEMPLOYMENT	+1.02 (0.47)	.1857
EMPLOYMENT	+.01 (0.00)	.0073
ΔUNEMPLOYMENT	+.17 (0.29)	-.0189
ΔEMPLOYMENT	-.05 (0.06)	-.0190
WAGE	+.00 (0.51)	.2585
RECRUITER DENSITY	+149.84 (1.41)	.1055
MILITARY	+2.82** (4.10)	.0474
NON-WHITE	-1.45*** (7.44)	-.1871
REGION 3	+.17** (4.71)	
REGION 4	+.05 (0.35)	
REGION 5	+.27** (5.97)	
REGION 7	+.22** (6.02)	
REGION 8	+.13* (2.86)	

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

SECTION A-8

RECRUITER PRODUCTIVITY

TABLE A8-1

RECRUITER PRODUCTIVITY
AFQT SCHOOL ELIGIBLE MALES
COEFFICIENTS (F-STATISTICS)

	TIME PERIOD		
	1975/2	1976/1	1976/2
CONSTANT	+4.72 (0.15)	+4.52 (0.11)	+1.27 (0.01)
UNEMPLOYMENT	+95.57** (4.22)	+101.08* (3.21)	155.31*** (6.80)
EMPLOYMENT	+.10 (0.00)	-1.69 (0.00)	-2.43 (0.01)
ΔUNEMPLOYMENT	-5.58 (0.74)	-6.16 (0.45)	-5.36 (0.36)
ΔWAGE	-5.05 (0.04)	+5.36 (0.18)	-90.68** (4.20)
MILITARY	+28.89 (0.38)	+17.16 (0.11)	+15.26 (0.09)
NON-WHITE	-12.33 (2.43)	-12.29 (2.01)	-11.60 (1.74)
REGION 3	+1.51 (0.35)	+1.46 (0.00)	+8.32*** (7.40)
REGION 4	+4.02* (3.29)	+3.16 (1.25)	+8.69*** (10.75)
REGION 5	-1.75 (0.30)	-.58 (0.02)	+5.18 (1.69)
REGION 7	+.09 (0.00)	-2.21 (0.44)	+2.44 (0.58)
REGION 8	-.85 (0.12)	-2.01 (0.50)	+.81 (0.09)
R^2	.15	.13	.19

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A8-2

RECRUITER PRODUCTIVITY
MALE AFQT SCHOOL ELIGIBLE

ELASTICITIES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.6639	.7443	1.0554
Employment	.0034	-.0618	-.0904
ΔUnemployment	.0176	.0127	.0351
ΔWage	-.0271	.0178	-.3571
Military	.0181	.0114	.0105
Non-White	-.1465	-.1559	-.1500

TABLE A8-3

CORRELATIONS BETWEEN RECRUITER PRODUCTIVITY AND INDEPENDENT VARIABLES

MALE AFQT SCHOOL ELIGIBLE

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.252	.227	.175
Employment	-.155	-.125	-.168
ΔUnemployment	-.134	-.040	.037
ΔWage	-.007	.080	-.179
Military	.012	-.037	.015
Non-White	-.187	-.177	-.068
Region 3	-.046	-.031	.073
Region 4	.218	.168	.200
Region 5	-.159	-.069	-.049
Region 7	-.122	-.181	-.128
Region 8	.001	-.029	-.048

TABLE A8-4

RECRUITER PRODUCTIVITY
MALE HIGH SCHOOL GRADUATES
COEFFICIENTS (F-STATISTICS)

	TIME PERIOD		
	1975/2	1976/1	1976/2
CONSTANT	+5.14 (0.14)	+7.21 (0.15)	+13.51 (0.63)
UNEMPLOYMENT	+99.64** (3.96)	+105.66 (2.31)	+162.92** (5.74)
EMPLOYMENT	-4.04 (0.03)	-5.48 (0.03)	-10.89 (0.15)
ΔUNEMPLOYMENT	-6.74 (0.97)	-7.90 (0.48)	-2.89 (0.08)
ΔWAGE	+3.35 (0.01)	+9.12 (0.10)	-113.84** (5.14)
MILITARY	+25.53 (0.26)	+41.36 (0.43)	-8.05 (0.02)
NONWHITE	-7.24 (0.73)	-8.65 (0.66)	-6.43 (0.40)
HIGHQ	+1.17 (0.02)	-1.03 (0.01)	-9.65 (0.40)
REGION 3	+.13 (0.00)	-.12 (0.00)	+7.24** (4.13)
REGION 4	+3.74 (2.56)	+3.62 (1.11)	+9.76*** (10.46)
REGION 5	-2.27 (0.44)	-2.68 (0.29)	+5.05 (1.13)
REGION 7	-.05 (0.00)	-4.03 (0.97)	+1.25 (0.12)
REGION 8	-.08 (0.01)	-2.16 (0.36)	-.84 (0.07)
R^2	.15	.12	.21

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A8-5
RECRUITER PRODUCTIVITY
MALE HIGH SCHOOL GRADUATES
ELASTICITIES

	1975/2	1976/1	1976/2
Unemployment	.6407	.7055	.9775
Employment	-.1265	-.1818	-.3579
ΔUnemployment	.0196	.0140	.0167
ΔWage	.0166	.0275	-.3958
Military	.0148	.0261	-.0049
Non-white	-.0796	-.1026	-.0734
High Q	.0654	-.0602	-.0535

TABLE A8-6

CORRELATIONS BETWEEN
RECRUITER PRODUCTIVITY (HIGH SCHOOL GRADUATES)
AND INDEPENDENT VARIABLES

VARIABLES	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.264	.224	.176
Employment	-.167	-.146	-.190
ΔUnemployment	-.139	-.026	.081
ΔWage	.015	.083	-.203
Military	.025	.015	-.005
Non-white	-.155	-.131	.009
High Q	.085	.065	-.046
Region 3	-.084	-.047	.094
Region 4	.211	.181	.218
Region 5	-.170	-.106	.076
Region 7	-.107	-.186	-.134
Region 8	.040	.009	-.087

SECTION A-9

QUALITY RATIO EQUATIONS

TABLE A9-1

RATIO OF AFQT SCHOOL ELIGIBLE ENLISTEES
TO TOTAL ENLISTEES
COEFFICIENTS (F-STATISTICS)

VARIABLE	TIME PERIOD 1975/2	1976/1	1976/2
CONSTANT	+.5022***	+.6055***	+.2820**
	(22.25)	(25.89)	(4.72)
UNEMPLOYMENT	+.4082	-.8485*	+.5436
	(1.22)	(3.67)	(1.57)
EMPLOYMENT	+.1769	-.2864	+.3323
	(0.91)	(2.10)	(2.44)
ΔUNEMPLOYMENT	+.0734	-.1013	-.0869
	(1.30)	(1.66)	(1.27)
ΔEMPLOYMENT	-.0465	-.3321	+.0694
	(0.01)	(0.71)	(0.02)
ΔWAGE	-.0669	-.6894	+.4557
	(0.11)	(0.15)	(1.15)
RECRUITER DENSITY	-.2008	+.2638	+.0902
	(0.31)	(0.56)	(0.04)
MILITARY	+.3284**	-.1957	+.4869
	(4.82)	(0.25)	(1.28)
NON-WHITE	-.3534***	-.2052***	-.3633**
	(27.23)	(16.95)	(20.59)
HIGHQ	+.2009	+.6055***	+.2518
	(2.52)	(19.74)	(2.65)
REGION 3	+.1101***	+.0871***	+.1040***
	(20.97)	(9.34)	(12.95)
REGION 4	+.0353**	+.008	+.0308
	(4.16)	(0.44)	(2.01)
REGION 5	+.0296	-.028	+.0411
	(1.63)	(0.90)	(1.66)
REGION 7	+.0186	-.019	+.0276
	(0.51)	(0.44)	(0.83)
REGION 8	+.0188	+.007	+.0244
	(0.93)	(0.11)	(1.24)
R^2	.37	.35	.37

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A9-2

RATIO OF AFQT SCHOOL ELIGIBLE ENLISTEES
TO TOTAL ENLISTEES

ELASTICITIES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.0474	-.1015	.0754
Employment	.1015	-.1717	.2158
ΔUnemployment	-.0041	.0035	.0103
ΔEmployment	-.0015	-.0025	.0031
ΔWage	-.0060	-.0037	.0312
Recruiter Density	-.0081	.0121	.0038
Military	.0087	-.0022	.0057
Non-White	-.0687	-.0614	-.0796
HighQ	.1696	.3973	.2357

TABLE A9-3

CORRELATIONS BETWEEN THE RATIO OF AFQT SCHOOL ELIGIBLE ENLISTEES TO TOTAL ENLISTEES AND THE INDEPENDENT VARIABLES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.183	.044	.031
Employment	-.053	-.037	.115
ΔUnemployment	.065	-.136	-.229
ΔEmployment	-.058	.084	.115
ΔWage	-.103	-.033	-.229
Recuriter Density	-.085	.024	-.039
Military	.109	-.055	-.021
Non-White	-.393	-.431	-.446
HighQ	.274	.314	.366
Region 3	.106	.043	-.018
Region 4	-.030	-.023	-.005
Region 5	.064	-.011	.117
Region 7	-.215	-.158	-.206
Region 8	.116	.058	.120

TABLE A9-4

RATIO OF HIGH SCHOOL GRADUATE ENLISTEES

TO TOTAL ENLISTEES

COEFFICIENTS (F-STATISTICS)

VARIABLE	TIME PERIOD 1975/2	1976/1	1976/2
CONSTANT	+.5192*** (15.07)	+.4133*** (7.44)	+.7360*** (35.88)
UNEMPLOYMENT	+.8107* (3.07)	+.6423 (1.35)	-.0374 (0.01)
EMPLOYMENT	+.0915 (0.15)	+.0145 (0.00)	-.3351* (2.77)
ΔUNEMPLOYMENT	+.0723 (1.16)	+.0459 (0.26)	+.0641 (0.79)
ΔWAGE	+.1672 (0.38)	-.1388 (0.32)	+.2526 (0.48)
RECRUITER DENSITY	+.3667 (0.54)	+.7988* (2.89)	-.1186 (0.10)
MILITARY	+1.1952** (6.34)	+1.4819*** (8.35)	+.2440 (0.34)
NON-WHITE	+.0192 (0.06)	+.0919 (1.12)	+.2300*** (9.93)
HIGHQ	+.1463 (2.61)	+.3049*** (9.35)	+.1371* (2.79)
REGION 3	+.0273 (1.04)	+0187 (0.28)	+.0295 (1.34)
REGION 4	+.0157 (0.48)	-.0293 (1.16)	-.0077 (0.13)
REGION 5	-.0379 (1.61)	-.1577*** (16.50)	-.0396 (1.59)
REGION 7	-.0225 (0.60)	-.1139** (11.47)	-.0769*** (8.37)
REGION 8	+.0377 (2.18)	-.0251 (0.80)	-.0289 (1.72)
R^2	.21	.36	.32

SIGNIFICANCE: * 90% LEVEL
** 95% LEVEL
*** 99% LEVEL

TABLE A9-5

RATIO OF HIGH SCHOOL GRADUATE ENLISTEES
TO TOTAL ENLISTEES
ELASTICITIES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.0868	.0742	-.0039
Employment	.0485	.0084	-.1942
ΔUnemployment	-.0037	-.0016	-.0068
ΔWage	.0138	-.0073	.0154
Recruiter Density	.0131	.0356	-.0050
Military	.0116	.0158	.0025
Non-white	.0034	.0185	.0450
High Q	.1371	.3096	.1356

TABLE A9-6

CORRELATIONS BETWEEN
RATIO OF HIGH SCHOOL GRADUATE ENLISTEES
TO TOTAL ENLISTEES
AND INDEPENDENT VARIABLES

VARIABLE	TIME PERIOD		
	1975/2	1976/1	1976/2
Unemployment	.263	.302	.140
Employment	-.192	-.233	-.220
ΔUnemployment	.071	.097	.175
ΔWage	-.014	-.091	.075
Recruiter Density	.062	.038	-.071
Military	.252	.177	.038
Non-white	.012	.046	.340
High Q	.028	.089	-.057
Region 3	.037	.122	.357
Region 4	.008	.008	.026
Region 5	-.209	-.355	-.151
Region 7	-.089	-.253	-.266
Region 8	.257	.100	-.112

APPENDIX B

SMSAS IN THE SAMPLE

SMSAS IN THE SAMPLE

1.	0080	Akron, Ohio
2.	0160	Albany-Schenectady-Troy, N.Y.
3.	0200	Albuquerque, N. M.
4.	0240	Allentown-Bethlehem-Easton, Pa.
5.	0360	Anaheim-Santa Ana-Garden Grove, Calif.
6.	0460	Appleton-Oshkosh, Wisc.
7.	0520	Atlanta, Georgia
8.	0600	Augusta, Georgia
9.	0640	Austin, Texas
10.	0680	Bakersfield, Calif.
11.	0720	Baltimore, Md.
12.	0760	Baton Rouge, La.
13.	0840	Beaumont-Port Arthur-Orange, Texas
14.	0960	Binghamton, N.Y.
15.	1000	Birmingham, Ala.
16.	1123	Boston, Mass.
17.	1163	Bridgeport-Stamford-Norwalk-Danbury, Conn.
18.	1280	Buffalo, N.Y.
19.	1320	Canton, Ohio
20.	1480	Charleston, W. Va.
21.	1520	Charlotte-Gastonia, N.C.
22.	1560	Chattanooga, Tenn.
23.	1600	Chicago, Ill. 2/
24.	1640	Cincinnati, Ohio
25.	1680	Cleveland, Ohio
26.	1720	Colorado Springs, Colo.
27.	1760	Columbia, S.C.
28.	1840	Columbus, Ohio
29.	1880	Corpus Christi, Texas
30.	1920	Dallas-Fort Worth, Texas
31.	1960	Davenport-Rock Island-Moline, Iowa 1/ 2/
32.	2000	Dayton, Ohio
33.	2080	Denver-Boulder, Colo.
34.	2120	Des Moines, Iowa 1/
35.	2160	Detroit, Mich.
36.	2240	Duluth-Superior, Minn.
37.	2320	El Paso, Texas
38.	2360	Erie, Pa.
39.	2440	Evansville, Ind.
40.	2640	Flint, Mich.
41.	2680	Fort Lauderdale-Hollywood, Fla.
42.	2760	Fort Wayne, Ind.
43.	2840	Fresno, Calif.
44.	2960	Gary-Hammond-East Chicago, Ind.
45.	3000	Grand Rapids, Mich.
46.	3120	Greensboro-Winston-Salem-High Point, N.C.
47.	3160	Greenville-Spartanburg, S.C.
48.	3240	Harrisburg, Pa.
49.	3283	Hartford-New Britain-Bristol, Conn.

SMSAS IN THE SAMPLE

50.	3320	Honolulu, Hawaii
51.	3360	Houston, Texas
52.	3400	Huntington-Ashland, West Va.
53.	3440	Huntsville, Ala.
54.	3480	Indianapolis, Ind.
55.	3560	Jackson, Miss.
56.	3600	Jacksonville, Fla.
57.	3640	Jersey City, N.J.
58.	3680	Johnstown, Pa.
59.	3720	Kalamazoo-Portage, Mich.
60.	3760	Kansas City, Mo.
61.	3840	Knoxville, Tenn.
62.	3980	Lakeland-Winterhaven, Fla.
63.	4000	Lancaster, Pa.
64.	4040	Lansing-East Lansing, Mich.
65.	4120	Las Vegas, Nevada
66.	4280	Lexington-Fayette, Kentucky
67.	4400	Little Rock-North Little Rock, Ark.
68.	4410	Long Branch-Asbury Park, N.J.
69.	4440	Loraine-Elyria, Ohio
70.	4480	Los Angeles-Long Beach, Calif.
71.	4520	Louisville, Kentucky
72.	4920	Memphis, Tenn.
73.	5000	Miami, Fla.
74.	5080	Milwaukee, Wisc.
75.	5120	Minneapolis-St. Paul, Minn.
76.	5160	Mobile, Ala.
77.	5360	Nashville-Davidson, Tenn.
78.	5380	Nassau-Suffolk, N.Y.
79.	5400	New Bedford-Fall River, Mass.
80.	5460	New Brunswick-Perth Amboy-Sayreville, N.J.
81.	5480	New Haven-West Haven-Waterbury-Meriden, Conn.
82.	5560	New Orleans, La.
83.	5600	New York, N.Y.
84.	5640	Newark, N.J.
85.	5680	Newport News-Hampton, Va. 1/
86.	5720	Norfolk-Virginia Beach-Portsmouth, Va.
87.	5745	Northeast Pennsylvania
88.	5880	Oklahoma City, Okla.
89.	5920	Omaha, Nebr.
90.	5960	Orlando, Fla.
91.	6000	Oxnard-Simi Valley-Ventura, Calif.
92.	6040	Paterson-Clifton-Passaic, N.J.
93.	6080	Pensacola, Fla.
94.	6120	Peoria, Ill. 1/ 2/
95.	6160	Philadelphia, Pa.
96.	6200	Phoenix, Ariz.
97.	6280	Pittsburgh, Pa.

SMSAS IN THE SAMPLE

98.	6440	Portland, Ore.
99.	6480	Providence-Warwick-Pawtucket, R.I.[1/]
100.	6640	Raleigh-Durham, N.C.
101.	6840	Rochester, N.Y.
102.	6880	Rockford, Ill. [1/2/]
103.	6920	Sacramento, Calif.
104.	7040	St. Louis, Mo.
105.	7120	Salinas-Seaside-Monterey, Calif.
106.	7160	Salt Lake City-Ogden, Utah[1/]
107.	7240	San Antonio, Texas
108.	7320	San Diego, Calif.
109.	7360	San Francisco-Oakland, Calif.
110.	7400	San Jose, Calif.
111.	7480	Santa Barbara-Santa Maria-Lompoc, Calif.
112.	7600	Seattle-Everett, Wash.
113.	7680	Shreveport, La.
114.	7800	South Bend, Ind.[1/]
115.	7840	Spokane, Wash.
116.	8000	Springfield-Chicopee-Holyoke, Mass.[1/]
117.	8120	Stockton, Calif.
118.	8160	Syracuse, N.Y.
119.	8200	Takoma, Wash.
120.	8280	Tampa-St. Petersburg, Fla.
121.	8400	Toledo, Ohio
122.	8480	Trenton, N.J.
123.	8520	Tuscon, Ariz.
124.	8560	Tulsa, Okla.
125.	8680	Utica-Rome, N.Y.
126.	8720	Vallejo-Fairfield-Napa, Calif.
127.	8840	Washington, D.C.
128.	8960	West Palm Beach-Boca Raton, Fla.
129.	9040	Wichita, Kansas
130.	9160	Wilmington, Del.
131.	9240	Worcester-Fitchburg-Leominster, Mass.
132.	9280	York, Pa.

[1/] Not in Recruiter Productivity equations.

[2/] Only included in 1975 equations. Wage data was missing for 1976.

Manpower R&D Program - Distribution of Technical Reports

Part I - Mandatory August 1979

One copy to each addressee except as otherwise noted:

Manager, Program in Manpower R&D - 12 copies
Code 450
Office of Naval Research
Arlington, VA 22217

Defense Documentation Center - 12 copies*
DDC/DDA-2
Cameron Station, Building 5
Alexandria, VA 22314

Science and Technology Division
Library of Congress
Washington, DC 20540

Commanding Officer
Naval Research Laboratory
Code 2627
Washington, DC 20375

Psychologist
Office of Naval Research Branch Office
Building 114, Section D
666 Summer Street
Boston, MA 02210

Psychologist
Office of Naval Research Branch Office
536 South Clark Street
Chicago, IL 60605

Psychologist
Office of Naval Research Branch Office
1030 East Green Street
Pasadena, CA 91106

Head, Manpower, Personnel, Training
and Reserves Team (Op-964D)
Office of the Chief of Naval Operations
4A578, The Pentagon
Washington, DC 20350

Assistant for Personnel Logistics Planning
Office of the CNO (Op-987P10)
5D772, The Pentagon
Washington, DC 20350

---

* If report is ready for unlimited public distribution

Scientific Advisor to the Deputy Chief of Naval
Operations (Manpower, Personnel, and Training)
Office of the DCNO(MPT) (Op-01T)
2705 Arlington Annex
Washington, DC 20350

Head, Research, Development, and Studies Branch
Office of the DCNO(MPT) (Op-102)
1812 Arlington Annex
Washington, DC 20350

Headquarters U.S. Marine Corps
Code MPI-2C
Washington, DC 20380

Program Administrator for Manpower,
Personnel, and Training
HQ Naval Material Command (Code 08D22)
678 Crystal Plaza #5
Washington, DC 20360

Director, Decision Support Systems Branch
Naval Military Personnel Command (N-164)
1818 Arlington Annex
Washington, DC 20370

Head, Evaluation Section
Naval Military Personnel Command (N-6C)
Department of the Navy
Washington, DC 20370

Director, Research and Analysis Division
Plans and Policy Department
Navy Recruiting Command (Code 22)
4015 Wilson Boulevard
Arlington, VA 22203

Technical Director - 5 copies
Navy Personnel R&D Center
San Diego, CA 92152

Director, NPRDC Washington Liaison Office
Building 200, 2N
Washington Navy Yard
Washington, DC 20374

Department of Administrative Sciences
Naval Postgraduate School
Monterey, CA 93940
Attn: Dr. Richard S. Elster

Military Assistant for
Training and Personnel Technology
Office of the Under Secretary of
Defense for Research & Engineering
3D129, The Pentagon
Washington, DC 20301

Personnel Analysis Division
AF/MPXA
5C360, The Pentagon
Washington, DC 20330

Technical Director
U.S. Army Institute for the
Behavioral and Social Sciences
5001 Eisenhower Avenue
Alexandria, VA 22333

Program Director
Manpower Research and Advisory Services
Smithsonian Institution
801 North Pitt Street
Alexandria, VA 22314